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ANATOMIC STRUCTURE AND FUNCTION*

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Work well done along any line of human endeavor is a satisfaction and a reward in itself. Still it behooves us to pause once in a while in the press of our labors in order to ascertain whether the direction which we are following is the correct one, whether there is promise of progress commensurate to the effort employed or whether a shifting of the point of attack or a change of the means employed may not give better result. This seems to apply with special force to pathology at the present moment, when we hear such warnings as that addressed to us by Yandell Henderson, who, in 1911, stated before this section that "a man trained by autopsy and microscope is inevitably a morphologist. Just in proportion as he is fitted to deal with morphologic processes he is unfitted to handle and expound functions of a physical nature—unless, of course, he happens to be an all-around genius," or when we hear the repeated admonition of such men as Meltzer to pay less attention to morphologic problems and more to functional studies. If Henderson's assertion is at all correct, present conditions are truly deplorable, because many men have been and still are being trained by necropsy and microscope and if this study unfits them to understand function in its proper light, the sooner all efforts in this direction cease the better, because I cannot conceive of any object in morphologic research except as a help to the clearer understanding of function.

The question of the relation of structure to function is the great biologic problem, if we take structure in its broadest sense as including the structure of the chemical substances which make up the living protoplasm. In the last resort our interpretation of the relation of structure to function will rest on our conception of the relation of force to matter, and, as I believe we are all agreed that these two expressions designate merely two human ways of looking at the same thing, we might come to the conclusion that the whole discussion is idle and entirely futile. I do believe that this identity, if I may say so, of structure and function is sometimes lost sight of to the detriment of scientific reasoning, although nature, if we only look at it with open eyes, constantly reminds us of this fact, no more commonly perhaps than in the

field of pathology. Looking at the question from this broadest point of view it does not require much of an argument, for instance, to convince us that function determines structure just as in its turn structure determines, delimits—that is, places definite limits on function. Still, what we grant theoretically, must be worked out practically. It is with the practical imperfection of our knowledge that we are concerned and with the question of how best to improve on it.

Any student of medical history knows how much our knowledge of physiology has advanced with the gradual progress in gross anatomy and how much more many of the intricate problems were clarified by the knowledge of the finer structure of the tissues as revealed by the microscope. Our fundamental conceptions with regard to the cell as the living unit, with regard to cell life and cell activity, could not have been arrived at without the help of the microscope, and on this same solid basis of gross anatomic and histologic knowledge rests modern physiology, and with that pathology.

It is only natural that the splendid advances made by the introduction of the microscope aroused excessive expectations in the minds of some as to what might be accomplished by the use of this instrument. We certainly know now that it has its great limitations so far as power of vision and its applicability to living tissue is concerned; nevertheless, the insight which we have gained by means of it into physiologic and pathologic processes is truly remarkable.

If I may speak from the point of view of a pathologist, the condition of affairs at present seems to be something like this:

There exists quite a large and constantly growing territory in this science in which our knowledge of the gross and microscopic anatomy furnishes a very adequate explanation of the functional disturbances which we observe during life. This is especially true if we include parasitology, gross and microscopic, although here also the limit of usefulness of the microscope is being reached as shown by the experiments with filtrable virus.

It must be emphasized, however, that structural change does not necessarily mean change in function. I believe that in this regard the importance of minute histologic lesions in the tissue has been greatly exaggerated. We must constantly bear in mind, especially in the important glandular organs, the existence of a large amount of reserve tissue which must be eliminated before the function of the organ as a whole will be affected. We also have to take into account the remarkable power of regeneration and of compensatory hypertrophy which these organs possess. Even when we give due consideration to these

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* Chairman's address, read before the Section on Pathology and Physiology at the Sixty-Fifth Session of the American Medical Association, Atlantic City, June, 1914.

facts, however, it is often astonishing how well an organ has functionated during life in spite of the finding at necropsy of pretty definite and fairly diffuse lesions.

In fact, in some cases, the question arises whether the lesions which we find associated with disturbance of function are really the cause of the disturbance or merely concomitant. The mere fact that the development of clearly manifest lesions usually consumes considerable time (usually twenty-four hours and often much more) is very suggestive in this regard. If the lesions are to be the cause of the disturbance in function which we observe, they must precede the disturbance, but should not follow it. If, for instance, we produce a disturbance of the renal function by means of some renal irritant which manifests itself by albuminuria we observe the disturbances of function, if the irritation is sufficiently strong, within less than one hour, at which time even the most careful histologic study fails to reveal any change, whereas well-marked anatomic lesions develop as a rule in the course of the next twenty-four or thirty-six hours. Such lesions cannot very well be the cause of the disturbance in function; still they do indicate that by the insult the cells were injured in such a way as to lead eventually to a change in their structure. In other words, what we see is not the cause of the disturbance in function but the final result of a cell injury the actual nature of which is not demonstrable by the means at present at our disposal. This appears to me to be the reason why so many of the degenerative lesions resemble autolytic changes which take place in the dead tissue. Still, they are valuable, because after a while at least they do show us that the cells have been injured. I believe, however, that it is worth while to emphasize this fact that sometimes the lesions are secondary to a primary insult not associated with demonstrable anatomic changes because in the hurry of our teaching or in the abbreviated parlance of even scientific reports it is often lost sight of.

It has been said by some that further efforts in the refinement of our technic in this direction are apparently hopeless and a mere waste of time, and there may be some grain of truth in this statement. Still, I believe it is hazardous to prejudge a case of this kind and it would seem to be better policy to encourage men who have a natural bent along these lines, because, after all, the better the fundamental facts relating to the structural minutiae of the cells are worked out, the more secure the structure of our scientific edifice will be.

On the other hand, I know, from personal experience that there are large and important fields in pathologic anatomy which need much new work before they are anywhere near their possible completion. From this point of view, in many cases, the surface seems hardly to have been scratched. The common types have been fairly well established, but the more intricate problems, especially again in relation to the functional disturbances, have been hardly worked up at all. When we descend from the textbook picture to the individual case and to a careful scrutiny of its individual problems, we find no end of stimulation to investigation and research, even along anatomic lines.

In our study of function we cannot of course rest entirely on an anatomic basis, because evidently many problems connected with this subject are not open to anatomic investigation. The structural changes which

underlie them are so minute that they cannot be approached by means of the scalpel or the microscope. Recently, for instance, studies have been carried in our laboratory in regard to the severe disturbance in nitrogen metabolism which follow anaphylactic shock. They do not seem to be associated with any discernible lesions in any of the important organs, in spite of the fact that they persist for a considerable period of time and eventually cause the death of the animals. This is by no means an isolated example even if we exclude from consideration the central nervous system, the mysteries of which, in spite of great advances in our knowledge, are still so baffling.

In many of these problems undoubtedly chemistry or physical chemistry will step in and furnish us new clues. Judging from the material which has already accumulated along these lines the prospect for further important developments seems to be unusually bright. Still there are intrinsic difficulties in method which it will be difficult to overcome. As Meltzer has pointed out, chemical research labors under the same disadvantage as pathologic anatomy in dealing largely with dead material. There is also the distinct disadvantage of being confined so far to rather gross procedures which do not permit of a utilization of our knowledge of the finer histologic detail of the organs studied.

Microchemistry, that is, the application of chemical methods to histologic sections, has bridged over this gap in some instances and may do so in more, but, unfortunately, characteristic chemical reactions are to be obtained from bodies only when they are more or less dissociated, and the more intimately they are bound up with the living protoplasm, the less easily they are detected by chemical means without resorting to violent interference.

On account of these difficulties in the way of a direct application of exact chemical and physico-chemical methods, a large body of hypotheses has developed which is based on our present knowledge in organic chemistry, but which, so far, is beyond the reach of actual demonstration. I need only to allude to our chemical conceptions with regard to enzymes, toxins and the various immunity reactions in order to bring out this point clearly. It is to be hoped that a refinement of our present methods will permit us eventually to develop this knowledge to a satisfactory conclusion, and if we do succeed, our ideas with regard to the relation of chemical structure to function will necessarily be advanced immeasurably.

Progress along any of the lines mentioned—pathologic anatomy, parasitology, biologic chemistry and biologic physics—is absolutely impossible without experimental work. In fact, the animal experiment is the touchstone to any new idea which may develop in the field of biology, including medicine. The final proof of any contention in the biologic sciences rests in the animal experiment. On the other hand, the experiment needs the control of the other methods in order to make quite certain that the experimental results are applicable to the case in question.

The experimental study of function itself is naturally of the greatest importance, quite immaterial whether we understand the underlying factors or not. For practical purposes the value of such experimental researches may be so great that it may well be questioned whether some of the energy now directed to the elucidation of more obscure general problems could not with advantage be diverted along these new

and fruitful channels. If we know the modifications in function arising from physical or chemical changes in the environment of the functioning cell, we at once obtain means of controlling such function more or less, and what this means to the physician who has to deal with manifestations of disturbed function in his patients needs no amplification. In this way he frequently may obtain the desired effect in spite of the fact that the ultimate mechanism of the action is unknown, and a complete knowledge of the same possibly unattainable.

Such studies of function under carefully selected and well-controlled experimental conditions may also permit of very interesting conclusions with regard to the mechanism involved. Our knowledge of the chemical control of glandular function has been obtained in this way. There is also no question that some serious errors arising from a merely anatomic study of the parts involved have been corrected by this method, but after all it is a method with its own advantages and its own palpable limitations like all others.

In conclusion, then, I wish to emphasize that our goal of a thorough understanding of the biologic processes in health and disease cannot be reached by one method alone. Men with varying inclinations and varying training have to cooperate in order to make progress, and the more intricate our problems grow the more the necessity of such cooperation becomes evident.

It is of course an impossibility for any man to be a master in all branches of biologic research, but a fair degree of familiarity with all is necessary, to produce, if I may borrow a German expression, a friendly understanding, to avoid misconceptions and the development of that narrowness of view to which I imagine Professor Henderson wished to refer. I believe that laboratories in pathology, just like those in physiology, pharmacology, hygiene and clinical medicine, should be ready at any time to take up a problem from whichever point of view appears to be the most hopeful, with whatever methods seem to be indicated, and, if necessary, from as many points of view and with as many variations in method as seem desirable.

THE PRESENT STATUS OF PYELOGRAPHY *

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Sufficient evidence is furnished by the excellent work of Braasch and many others to establish without question of doubt the value of pyelography in the diagnosis of surgical diseases of the kidney and ureter. Additional testimony based on our own experience would mean merely a repetition of what has already been stated. Another phase of the subject, which is of equal importance and forms the theme of this paper, is the consideration of the harmful results that may follow collargol injection, its indications and limitations.

When we first began the use of pyelography, we shared the opinion of others that the injection of

collargol into the renal pelvis was free from danger and employed it routinely in all cases presenting symptoms which might be due to renal pathologic conditions. In the course of time we became convinced of the error of such a procedure. With increasing knowledge acquired from our own experience as well as that of others, we have put a decided limitation on the cases suitable for injection and have formulated a technic which we believe will reduce the disastrous sequelae of pyelography to the minimum.

That collargol produces little or no irritation of the pelvic mucosa seems to be proved by clinical and experimental evidence. Following injection in twenty of our cases, the urine rapidly lost the collargol stain, and microscopic examination was normal or showed only a slight excess of leukocytes with an occasional erythrocyte. Kidd¹ reports similar results. In his discussion of Kidd's paper, Walker states that he "has operated on a number of cases within a few days of the collargol examination and in every case the lining membrane of the renal pelvis was healthy and glistening even when the pelvic contents were deeply stained



Fig. 1.—Early tuberculosis of the kidney. From photomicrograph. Intense infiltration of collargol throughout all portions of the section, with well-marked destruction of kidney structure. High pressure used in making the injection.

with collargol. In some cases where nephrectomy was performed the mucous membrane was normal microscopically." This coincides with our own findings; in both specimens illustrated in this paper, the lining epithelium of the pelvis is normal although the kidney shows wide-spread changes. Blum,² on the other hand, reports extensive necrosis, but, as Strassmann³ points out, his experiments are open to criticism in that he used post-mortem specimens, and the changes which he ascribes to collargol could well have been cadaveric. The burden of proof, therefore, is that, so far as the renal pelvis is concerned, collargol is harmless.

That the injection may have a decidedly injurious effect on the kidney has been shown repeatedly and almost without exception; the pathologic reports detail the same results, namely, the tubules filled with collargol, which may extend into Bowman's capsules, rup-

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Kidd, Frank: *Proc. Roy. Soc. Med.*, 1913, vii.

2. Blum: *Wien. med. Wchnschr.*, 1912, No. 19.

3. Strassmann: *Ztschr. f. urol. Chir.*, March, 1913, p. 126.

ture of the tubules, peritubular round-cell infiltration, renal infarcts or areas of cortical necrosis. Strassmann alone maintains that the tubules are free, the collargol being taken up by the renal lymphatics or tissue clefts. The experimental work of Tennant,⁴ Oehlecker,⁵ Kidd and others, conclusively proves that collargol gains entrance to the kidney by way of the tubules and that the extent of involvement is directly dependent on the degree of pressure exerted in making

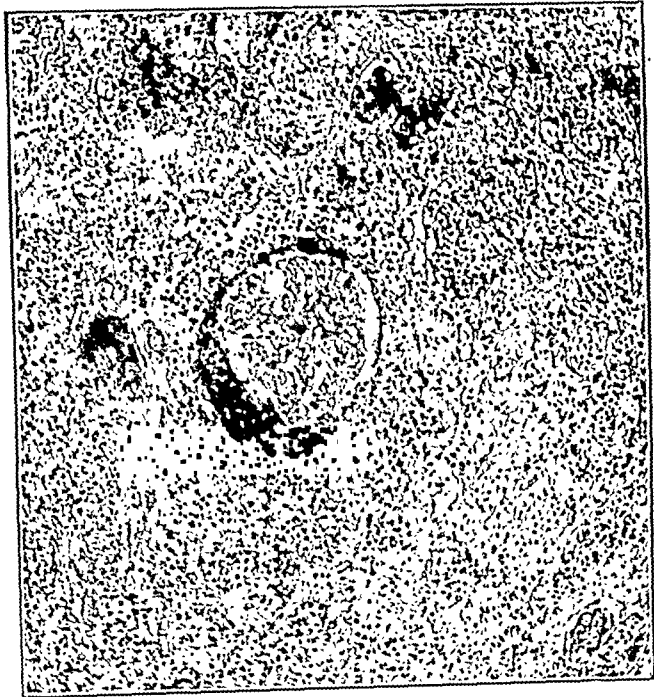


Fig. 2.—Same specimen as shown in Fig. 1. From photomicrograph. Argyrol in Bowman's capsule, also permeating the kidney tissue with a moderate degree of necrosis and round-cell infiltration.

the injection as well as the time that the solution is allowed to remain in the pelvis. The same results are reported clinically by Mason,⁶ Tennant⁴ and Troell.⁷ The accompanying photomicrographs (Figs. 1, 2 and 3) depict similar conditions. These injections were made during our earliest experience in pyelography and represent the ill results that may attend imperfect technic in types of disease in which, if used at all, the injection must be made with the greatest skill and care. Severe pain followed both injections and confirms Tennant in his statement that pain following collargol injection may have a graver significance than the mere overdistention of the pelvis, indicating the passage of the solution into the renal parenchyma.

The question naturally arises, Is the kidney permanently or seriously injured by collargol in the absence of superadded infection or such extensive lesions as infarction or necrosis? Pathologic evidence and clinical experience seem to indicate that this can be answered in the negative. Leukocytes, a few red blood-cells and hyaline casts may be present immediately following injection, but these soon disappear. Even in those cases in which violent pain and high fever have followed, such as reported by Vest⁸ and Zachrisson,⁹ the urine sooner or later returns to normal.

Evidence is available, therefore, which shows that wide-spread lesions of the kidney may result from collargol injection and as a rule go hand in hand with overdistention of the renal pelvis. In many cases, collargol may find its way into the straight tubules, but the resulting irritation of the renal parenchyma is usually trifling and produces no permanent injury. That a substance may be found which will be non-irritating as well as impermeable to the Roentgen ray is to be hoped for. Kelly and Lewis¹⁰ advocate silver iodid but their report is too meager to warrant acceptance until further accurate experimental and clinical evidence is submitted.

Our experience, together with a study of the cases reported in literature, convinces us that too much stress has been put on the supposed corrosive action of collargol, while in reality the fault lies in the method of injection or its application in types of disease which favor rapid permeation of the renal tissue.

As the result of his experiments with Berlin blue and other inert anilin dyes, Marcus¹¹ demonstrates with what ease trauma to the pelvis and kidney may be produced by even low pressure. If no injury were present, the coloring-matter merely lay in the pelvic clefts or ascended occasionally into the collecting tubules at the papillae, but was never found in the intratubular tissue. When the dye was found in the veins of the kidney, he invariably demonstrated a traumatic site of entrance in the pelvis or renal parenchyma. Under high pressure, it was an easy matter to produce a migration of any inert substance from the pelvis to the renal vein by way of the kidney, with emboli in various organs. He also shows, experimentally, that the site of rupture determines the area per-



Fig. 3.—Pyelonephritis and hydronephrosis. From photomicrograph. Fifty c.c. of a 10 per cent. argyrol solution were injected under high pressure. In this section the argyrol is confined within the tubules; the kidney tissue is well preserved.

meated by the dye which may be found in the renal vein, the subcapsular space or the peripelvic tissue.

The experimental work of Lewin¹² was done along similar lines and with like results, although he does not emphasize the importance of trauma as the exciting

4. Tennant: *Ann. Surg.*, 1913, lviii, 888.
5. Oehlecker, F.: *Fortschr. a. d. Geb. d. Röntgenstrahlen*, 1911, xvii, 195.
6. Mason, J. M.: *Dangers Attending Injections of the Kidney Pelvis for Pyelography*, *THE JOURNAL A. M. A.*, March 14, 1914, p. 839.
7. Troell: *Hygiea*, 1913, 75, p. 176; ref. in *Zentralbl. f. ges. Chir.*
u. d. Grenzgeb., 1913, i, No. 16, p. 829.
8. Vest: *Bull. Johns Hopkins Hosp.*, March, 1914, p. 74.
9. Zachrisson, F.: *A Case of Collargol-Injection into the Tubuli Recti of the Kidney*, *Nord. Med. Ark.*, 1911, xi, ref. in *Zentralbl. f. Chir.*, 1911, No. 50.

10. Kelly and Lewis: *Surg., Gynec. and Obst.*, 1913, xvi, 707.
11. Marcus: *Wien. klin. Wchnschr.*, 1903, No. 25.
12. Lewin: *Arch. f. exper. Path. u. Pharmacol.*, 1897-98, xl, 287.

factor in permitting the escape of the injected fluid. Emboli were found in the right heart, lungs and liver, corresponding to the recent report of Eisendrath¹³ and differing only in the fact that he used an anilin dye instead of collargol. The experiments of Strassmann, Kidd and Tennant, previously referred to, substantiate the findings of these investigators and show the possi-

(Troell) and one case of suppurative pyelonephritis (Schwartzwald¹⁵).

To these we add the cases herein reported, one of early tuberculosis and the other chronic pyelonephritis and hydronephrosis (Fig. 4). This is sufficient evidence to indicate that such lesions may act as at least contributing factors in the dissemination of collargol throughout the kidney, since they furnish ideal conditions for the production of a portal of entrance.

The effect of direct trauma by the ureteral catheter is nicely shown in the specimen of Mallory reported by Mason: "The collargol was injected into the kidney tissue as a result of running the catheter too far into the pelvis of the kidney. Evidently the point of the catheter went into a calyx and the fluid was injected under pressure into that calyx." Any one experienced in ureteral catheterization knows that unless the greatest care is used, it is an easy matter to traumatize the pelvis sufficiently to produce bleeding and thus bring about a condition similar to that seen in the specimen just mentioned.

Reviewing the cases reported in literature from the clinical point of view, pain following injection is the most frequent symptom. This may be very severe, requiring morphin for its relief, and persists for several hours or even days. Pain may follow the most careful manipulation in passing the catheter or the injection of only a few drops of collargol. In our experience this has occurred only rarely; when severe pain has resulted, it has been due to our faulty technic of catheterization or injection. When pyelography was first undertaken, we were inclined to ascribe this

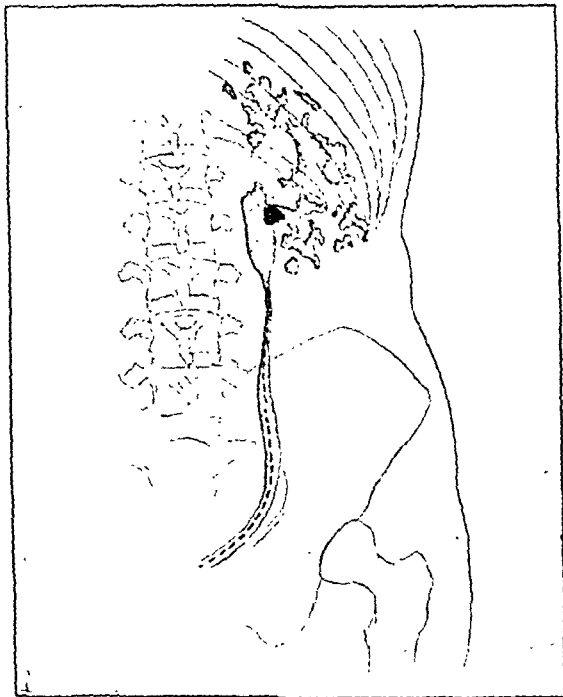


Fig. 4.—Calculus pyonephrosis showing diffuse permeation of collargol throughout kidney. Type of case unsuitable for pyelography.

bilities of danger which attends injection under high pressure, and also the relative freedom from danger when little or no distention of the pelvis is produced.

It is doubtless true that, in the earlier days of pyelography, many instances of severe pain or disastrous results following injection were due to an erroneous conception concerning the capacity of a normal pelvis. At that time the limits were stated by various observers as varying from 15 to 30 c.c., while at present we know that the capacity is between 2 and 5 c.c. It is only natural to assume, therefore, that, in making the injection, the normal capacity was many times exceeded.

We are firmly convinced that solution of continuity of tissue, whether by ulceration, or direct or indirect trauma, plays an important rôle in permitting the escape of collargol from the pelvis. The work of Marcus already referred to shows how even low grades of distention can break the pelvic lining in normal kidneys. In kidneys altered by disease, whether this be a thinning out as in hydronephrosis, an ulceration as in tuberculosis or tumor, or increased friability due to pyogenic infection, it is self-evident that ruptures of varying degrees are more prone to result. Of the reports in literature of cases in which extensive changes have been produced by collargol, it is interesting to note three cases of hypernephroma (Mason, Oehlecker and Rössle¹⁴), one case of pyonephrosis

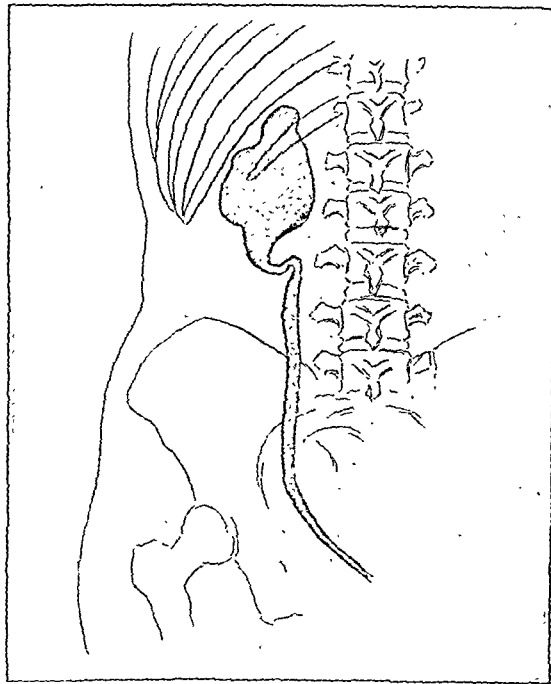


Fig. 5.—Colon bacillus pyelitis with marked dilatation of pelvis due to ureteral kink. Symptoms relieved by pelvic lavage. The usual methods of treatment together with autogenous vaccines had been unsuccessful.

pain to the irritation of the collargol, and varied the percentage of the solution from 1 to 10, with no apparent relationship between the strength of the solution and the intensity or absence of pain. It was evident that some other factor was active. We found

13. Eisendrath, Daniel: The Effect of Injecting Collargol into the Renal Pelvis, *THE JOURNAL A. M. A.*, May 2, 1914, p. 1392.

14. Rössle: Tödliche Kollargolvergiftung, *München. med. Wchnschr.*, 1911, lviii, 280.

15. Schwartzwald: *Beitr. z. klin. Chir.*, lxxxviii, No. 2.

that the frequency of pain was greatly diminished by inserting the catheter only part way up the ureter instead of into the pelvis. This plan is open to criticism in that it gives no idea of the pelvic capacity, but it does indicate that the avoidance of trauma to the pelvic mucosa is an important factor in lessening the harmful results, of which pain is often the only

pain whatever, proving conclusively its great advantage over the older method.

Several cases are reported in which fever has followed injection, persisting for days and in a few instances attended by the development of perirenal suppuration. As first pointed out by Voelcher and observed by Braasch and many others, collargol is not uncommonly found in the peripelvic tissue and produces little or no inflammatory reaction. We are convinced that a rise in temperature is due not to collargol *per se*, but that faulty technic has permitted the introduction of infection, with collargol as the medium by which it is carried to the kidney or its surrounding tissues.

Lastly, three deaths are reported as occurring after collargol injection. The often-quoted case of Rössle has been criticized by Strassmann who advances arguments which tend to disprove that collargol was the cause of death. More recently a second case is reported by Rosenblatt and Morgandies,¹⁷ in which a state of shock developed at the time of injection with death several hours later. In this case of suspected hydronephrosis, 40 c.c. of a 5 per cent. collargol solution was injected without difficulty. A post-mortem examination was not performed nor was the kidney examined microscopically. The perirenal tissues were widely infiltrated with collargol, there was no collargol in the pelvis or ureter and only a "minimal" tear was visible in the kidney tissue. In a case reported by Vest, death resulted on the fourteenth day after operation. Acidosis and acute dilatation of the stomach were postoperative complications. Vest does not

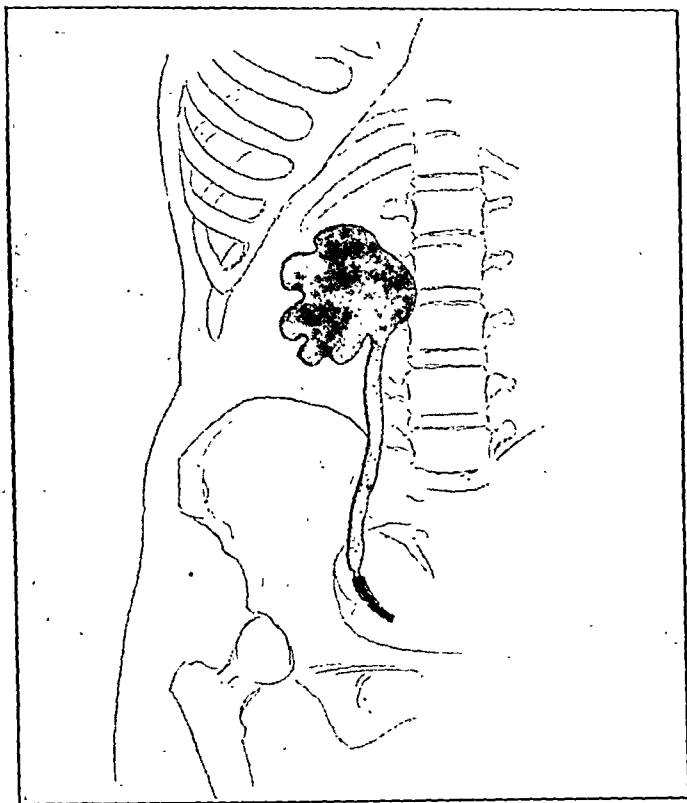


Fig. 6.—Stricture of ureter. Marked dilatation of ureter above stricture, and pyelonephritis of gonococcal origin. Pyelography was employed in order to eliminate calculus as a possible cause of ureteral obstruction. Lavage and collargol instillation resulted in temporary improvement.

symptom. As further proof of the ill effects of trauma, we have observed that pain almost constantly accompanies injection in cases in which bleeding follows catheterization.

The second and by far the most important cause of pain is overdistention of the renal pelvis: Whether we accept the evidence of Marcus that overdistention produces solution of continuity of the pelvic lining, or of other observers that the collargol ascends directly into the straight tubules without previous pelvic injury, the fact remains that, as a rule, the degree of permeation in the kidney is in direct relationship to the amount of pressure exerted by the distending medium.

We are in full accord with Tennant's statement that pain indicates in many instances the passage of collargol into the kidney tubules, and is not merely a colic incident to an overfilled pelvis. If the latter were true, the pain should cease shortly after the relief of pressure rather than persist for hours or days. We ascribe it to increased tension of the renal capsule, produced primarily by the sudden increase in volume of the kidney due to the entrance of collargol, and secondarily to reactive changes within the kidney incident to the injection of a mildly irritating, foreign substance. In seventy cases in which the piston syringe was employed, pain resulted in over 10 per cent.; in our last thirty cases, we have used the gravity method of injection as recommended by Thomas¹⁶ with no

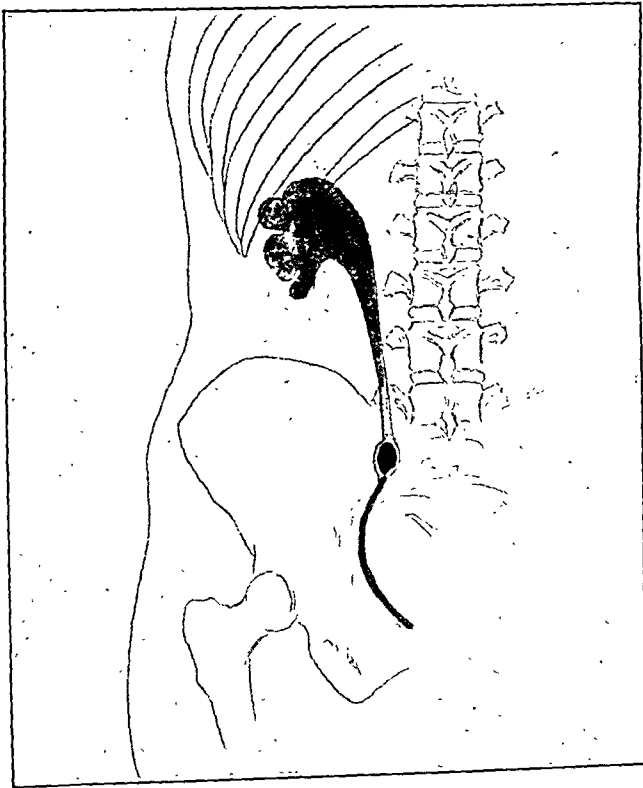


Fig. 7.—The roentgenogram failed to demonstrate a calculus. The catheter met an obstruction 13 cm. from the ureteral orifice. By means of a collargol injection, the calculus was clearly defined, together with a hydro-ureter and hydronephrosis.

assert that death was due to collargol poisoning, but draws attention to the interesting fact that, as in Rössle's case, hemorrhagic diathesis developed a few days before death. In his preliminary report, Eisen-

16. Thomas, G. J.: An Apparatus for the Injection and Lavage of the Pelvis and the Ureters, THE JOURNAL A. M. A., Jan. 18, 1913, p. 184.

17. Rosenblatt and Morgandies: Verhandl. d. deutsch. Röntg. Gesellsch., 1913, ix, 81.

Each has shown experimentally that death may result from emboli in various organs, but this has occurred only when collargol was injected under very high pressure. That similar results may follow injection in man is of course true, but with ordinary care and skill, we can state without fear of contradiction that this danger can be entirely eliminated.

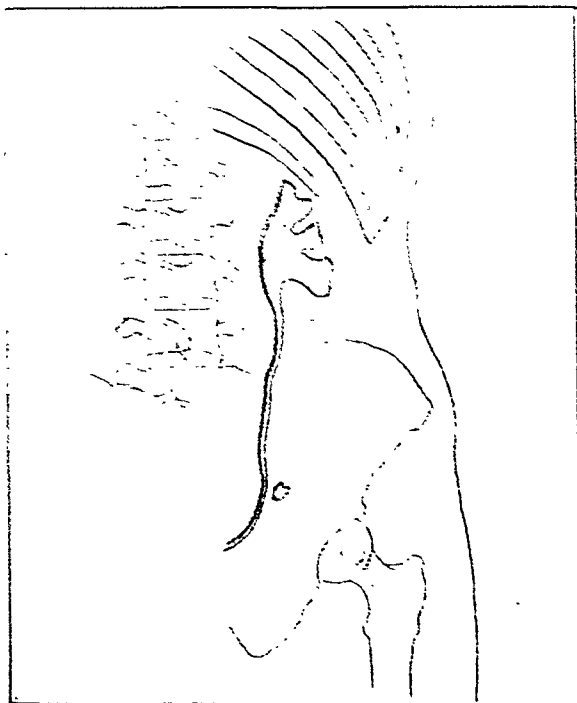


Fig. 8.—History in this case indicated ureteral calculus. A small cystic mass lay to the side of the uterus and the roentgenogram showed a shadow along the course of the ureter. Pycnography demonstrated a normal pelvis and ureter and an extra-ureteral shadow, which operation proved to be a tooth in a dermoid cyst.

CYSTOSCOPIC TECHNIC

Basing our ideas on experimental evidence as well as clinical experience, we have formulated certain points in technic which, in our opinion, are of importance in avoiding the untoward results of collargol injection. The greatest care as regards asepsis cannot be too strongly emphasized. The ureteral catheter should not exceed No. 6 in size, it must be free from rough surfaces and pliable so as easily to follow any change in the course of the ureter; to avoid trauma, we never use a stiletted catheter. The catheter is inserted for a distance of 20 cm. and its further progress is made extremely slowly until the slightest buckling occurs, which indicates that its tip has reached the pelvis. It is then withdrawn 1 or 2 cm. and the character of the urinary outflow is observed to determine, if possible, the presence or absence of pelvic dilatation. The catheter is then withdrawn 10 cm. and the injection made. By so doing the danger of wounding the pelvis is minimized and the tip of the catheter is below the level at which the majority of ureteral kinks are found.

If the urine is blood-stained, the injection is not made, a subsequent examination being advised at an interval of at least seven days. When an obstruction is encountered along the ureter, we do not attempt forcibly to overcome it, but pass a smaller catheter; if its passage is likewise impeded, the collargol is injected and in the majority of instances, will find its

way upward. The forcible passage of the ureteral catheter is to be condemned under any circumstance, but this is especially true when injection is to follow. We are opposed to the routine practice of simultaneous injection of both kidneys; when bilateral disease is suspected, the injections are made at two sittings. If for any reason, the roentgenogram is unsatisfactory, we make it a rule to allow several days to elapse before attempting a second injection.

The collargol is freshly prepared for each case; the crystals are thrown into a small mortar containing boiling water and when cooled are thoroughly dissolved by stirring with a pestle. The solution is filtered through cotton and gauze and is ready for injection. The strength of the solution varies from 5 to 10 per cent., depending on the thickness of the abdominal walls. In making the injection, we use a 30 c.c. buret connected with a short tube and stop-cock. To start the flow through the catheter, elevation of the buret to about 3 feet will be necessary but it is immediately lowered and allowed to flow in at an elevation of not more than 1 foot with a No. 6, and 2 feet with a No. 5 catheter. The injection is discontinued when the column of collargol ceases to fall or the patient experiences the first slight sensation of fullness in the kidney region. After the picture is taken, the collargol is drained off and the catheter removed.

We make it an invariable rule to keep our patients under observation in the hospital for twenty-four hours after injection and prescribe copious draughts of water during the first six hours. When retention from

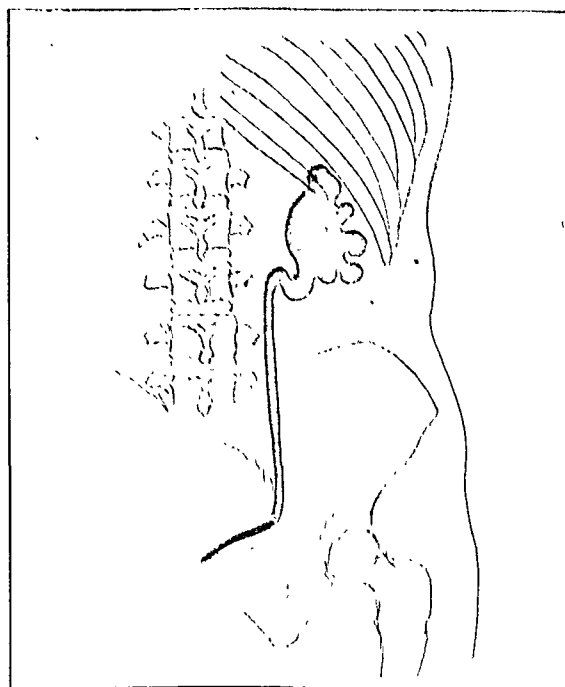


Fig. 9.—Ptosis of the left kidney with hydronephrosis. The catheter met an obstruction 4 cm. from the ureteral orifice. Pycnography demonstrated that the obstruction was not pathologic, but due to an abrupt change in the course of the normal ureter.

angulation of the ureter due to ptosis is suspected, the patient is required to remain in bed for twelve hours after the injection. This facilitates free drainage of any collargol that may remain in the pelvis of the kidney.

ROENTGENOGRAPHIC TECHNIC

The diagnosis of renal and ureteral conditions by pyelography depends on the correct interpretation of the roentgenogram made immediately after a careful ureteral catheterization and injection with the opaque solution. While each step is of equal importance, and each without the other is of little or no value, roentgenography plays but a minor part in the procedure as a whole. It is to be regarded simply as a means of accurately demonstrating and recording what the cystoscopist has done. The real value of the method arises in a very large measure from the technic of the cystoscopist in creating correct appearances for the roentgenogram to portray in order to demonstrate existing conditions accurately.

When employed as a safe and necessary procedure, pyelography has a very limited range of application as compared to the usual routine roentgenoscopy of the urinary tract. It is to be employed, as a rule, there-

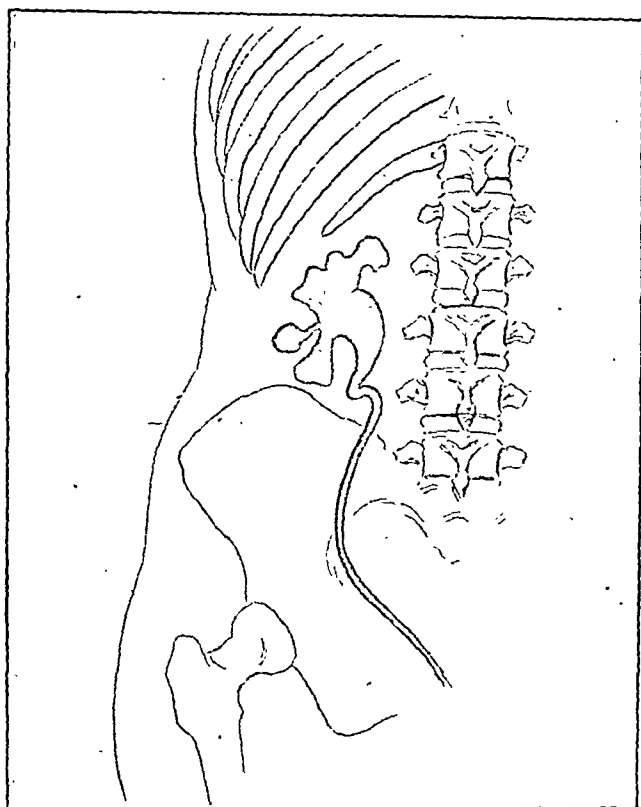


Fig. 10.—Beginning dilatation of the pelvis in a case of nephroptosis.

fore, only after the usual methods have failed to show any condition satisfactorily explaining the clinical phenomena present. Certainly, whenever calculus is suspected, the usual routine roentgenoscopy should always be resorted to first, as the injection of collargol may not only be unnecessary but is likely to interfere with the detection of a stone, especially in the kidney. Instances are recorded, on the other hand, in which the colloidal silver injection has rendered a calculus sufficiently opaque to cast a perceptible shadow when it was not detected by the simple roentgenoscopy alone. We are able to cite one experience of this kind in connection with a ureteral stone which was distinctly shown by the collargol injection, whereas no shadow could be detected in roentgenograms made at previous and subsequent examinations in the usual manner. Of course, such instances are exceptional.

There is little to be said of the roentgenographic technic *per se*. Preliminary preparation of the patient is always essential, and comprises the withholding of

food, pills and tablets, and the thorough evacuation of the intestinal tract. As we have found castor-oil disagreeable and not always satisfactory in removal of gas, we have recently adopted the use of compound cathartic pills pulverized and administered in capsules, and have found this procedure more efficacious.

Compression, which is so essential in the usual roentgenoscopy of the urinary tract, had best be avoided in connection with pyelography, for obvious reasons. When stout individuals are to be examined, the intensifying screen may become essential, if not used routinely.

In the early days of pyelography, Stover advocated the use of a table whereby one exposure could be made in the usual horizontal posture, and repeated immediately in the semirecumbent or vertical position by tilting the table. Such a procedure is obviously useful in the diagnosis of ureteral kinks associated with movable kidneys, but we have found it by no means essential. The substitute performance of having the patient get off the table and stand for the second exposure is to be condemned.

In our analysis of the cases reported in literature, it is evident that the harmful effects of collargol have, in many instances, been due to sins of omission or commission on the part of the operator and should not be held to the discredit of the injection itself. On the other hand, it has been shown that, even with the greatest skill and care, there are possibilities of danger which should serve as a warning against the indiscriminate injection of collargol, irrespective of the underlying pathology. For this reason, we resort to pyelography only when an accurate diagnosis cannot be made by other methods of examination.

We are opposed to its use in depicting interesting anomalies when such a procedure means merely a graphic representation of what may be accomplished by the method. We are likewise opposed to its indiscriminate use in all types of renal pathology; for experimental as well as clinical evidence indicates that possibilities of harm are certainly increased in the presence of ulceration, infection or retention of the solution in the pelvis. For this reason, with only rare exceptions is the injection made in suspected cases of neoplasm, tuberculosis or large hydronephrosis. Likewise, in those infections other than tuberculosis, we hesitate to employ collargol until other methods of diagnosis have been exhausted. It is of the utmost importance in the treatment of pyelitis to determine whether we are dealing with a mechanical dilatation of the pelvis with superimposed infection or with a true primary infectious pyelitis, and if other methods fail to reveal the desired information, the risk of pyelography is far outweighed by the accurate data which it affords.

When renal or ureteral calculi can be definitely recognized in the roentgenogram, little or no additional information will be afforded by pyelography; the injection is indicated only when the position and character of the shadow make it impossible to determine whether it lies within the kidney or ureter or in adjacent structures. This applies especially to those cases in which in addition to the shadow along the course of the lower ureter, the catheter meets with an obstruction at a corresponding level. Such evidence is of course strongly in favor of calculus, but is by no means positive, since inability to pass the catheter above a certain level is not infrequently due to an

abrupt change in the course of the normal ureter. This point will be quickly determined by the presence or absence of ureteral dilatation above the site of obstruction.

The pyelograph serves its greatest field of usefulness in detecting the earlier stages of hydronephrosis due to mechanical blockage of the ureter other than that caused by stone. In fact, it is the only means at our command which permits the diagnosis to be made without question of doubt. This applies likewise to certain congenital anomalies, especially the horseshoe and the dystopic kidney. Under these circumstances, if proper technic be employed, collargol injection can be made with but the barest possibility of harmful sequelae.

That exceptions to these general rules in the selection of cases will arise from time to time, is quite obvious, but such exceptions are rare, and in no way detract from the general principles which we have formulated for our own guidance. We may err on the side of conservatism, but we are satisfied that it is likewise on the side of safety, for we are convinced that possibilities of danger exist even under the most ideal circumstances. In the majority of instances, however, disastrous results following collargol injection have been due not to the use but to the abuse of the method, and we are confident that if greater care be given to the technic of injection as well as to the selection of cases, the dangers of pyelography will be of minor importance as compared to the valuable information which its use will afford.

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ABSTRACT OF DISCUSSION

DR. W. F. BRAASCH, Rochester, Minn.: Undoubtedly Drs. Keene and Pancoast should be given great credit for calling our attention to the possibility of ill results from the use of pyelography. If we remember the history of cystoscopy we shall recall that illness and death were reported, so that for a while the method fell into discredit. Ureteral catheterization also was criticised so severely that many would not permit patients to be so treated. While undoubtedly its abuse may cause harmful results, nevertheless it will remain as an invaluable method of diagnosis in conditions in the ureteral tract. It is a peculiar thing that of the deaths recently reported as the result of pyelography, the cases have been almost entirely in the hands of men of little experience. Our experience in 2,000 cases treated with pyelography has not given us serious results which could be ascribed to its use in any case. In my early use of the method I have observed three cases of cortical lesion in which I should not have used it. I have laid down the fundamental rule never to make more exploration of the tract than is necessary for diagnosis. There is a long list of conditions in which I have diagnosed obscure symptomatology which could not have been diagnosed in any other way. Our endeavor should be to find some substance which is harmless and which can be injected without causing the colloidal poisoning. If drainage is interfered with there will be trouble; if the kidney is overdistended there will be trouble. By means of the gravity method we have overcome the dangers of overdistention, but we cannot always overcome the dangers of overretention, but the dangers are reduced to a minimum. The silver iodid advised by Kelly seems to me to be a valuable adjunct. It cannot be employed in the gravity method, but must be employed with the syringe because of its viscosity. The ideal substance should be sufficiently liquid to be used in the gravity method and one which would not cause necrosis if retained. Pyelography should be in the hands only of men with wide experience in the work.

DR. HENRY DAWSON FURNISS, New York: There are still many dangers in pyelography, due to the mechanical insult of its performance and to the irritating effect and toxicity of the substances used. The ideal substance must be non-irritating, non-toxic and soluble in both water and the blood. Eisendrath has done some good experimental work in the injection of argyrol and collargol under pressure, and has found these substances not only in the tubules of the kidney, but also in the interstitial connective tissue, as well as in other organs of the body. The wide distribution he found due to entrance of the collargol through ruptured veins. In the Genito-Urinary Section were reported four or five fatalities following the use of collargol. In some, death was within a short time and in others followed within ten days or two weeks. In these late fatalities a hemorrhagic condition developed, with bleeding from the mouth, nose, stomach and under the skin; there were superficial ulcers in the mouth. In making pyelographs, my technic is to fill the bladder with boracic acid solution, put the patient on the table, have the Roentgen-ray plate and tube adjusted, then catheterize the ureter using a soft No. 5 or 6 catheter, clamp the cystoscope in position with a holder, and then make the injection under gravity. This saves a lot of unnecessary moving of the patient, which is disagreeable and tends to displace the catheter. The soft catheter is used, as stiff ones are capable of injuring the kidney substance so that the collargol can enter the circulation of the kidney substance. By using small catheters there is less danger of harm, as the collargol can escape alongside of the catheter. Even with the most careful technic severe pain often attends making a pyelograph. I am of the opinion that the pain is due to other factors than the simple distention, as I have never noticed such long and severe pain in the cases where I have distended the renal pelvis for diagnosis according to the method of Kelly. I agree with Drs. Keene and Pancoast that pyelography is a most valuable diagnostic aid and one to be used only when other methods do not furnish us the necessary knowledge. It is especially useful in early hydronephrosis and easily passable strictures of the ureter.

DR. D. N. EISENDRATH, Chicago: I have had occasion to use pyelography a great deal but have felt that I was not justified in using it with the syringe, unless I knew just where the danger-line was. In my first case the patient, who was 54 years old, died within half an hour after the injection. I made up my mind there must be some reason why the collargol in the urine caused trouble. We knew that the gravity method was apparently the safest and so we elevated a column of collargol $3\frac{1}{2}$ feet above the level of the table and caused a pressure of 30 mm., injecting a certain series of animals with 10 per cent. collargol, about 8 ounces, and killed them at different intervals. We were the first to use the manometer and by measurement were able to state the exact amount of pressure used to inject the collargol into the high renal pelvis. In this first series there were no changes; we could find no collargol except in one kidney. We had proved, experimentally, that the collargol was perfectly safe so long as we did not raise the pressure above 30 mm. In the second series we increased our pressure from 30 to 70 mm. and still kept as close as we could to the capacity of the renal pelvis of the dog—from 2 to $7\frac{1}{2}$ c.c.—seldom over 5 c.c. The animal lived. There was collargol in the lungs, in small quantity in the liver and in the kidney. In the animals that lived for thirty days after the experiments, what Drs. Keene and Pancoast have said, was true; the collargol did not kill off the epithelium, but we got much inflammatory reaction. Then we decided to increase our pressure. The first animal in this series we subjected to a pressure of 100 mm. and injected 20 c.c. and it died in five minutes from the time of beginning the injection. By the time the last of the fluid was in, the animal was dead. At necropsy we found that the lungs were perfectly black. They evidently had been filled completely with the collargol. The collargol filled every capillary of the lung as if injected for histologic purposes. The liver showed nodules, with quantities of collargol in the form of

The exception taken to the exclusion method of Doyen¹ and von Eiselsberg,² tried out by Haberer,⁴ Jonnesco,⁵ Jianu,⁶ Girard,⁷ Leriche,⁷ Bressot,⁷ Grossman,⁷ and Küttner,⁸ is the difficulty of execution and the increased percentage of mortality.

Kolb,⁹ Bircher,¹⁰ Hercher,¹¹ Hoffmann,¹² and Göbell¹³ have tried out the Wilms¹⁴ method with the strip of living tissue, and Naselli,¹⁵ using various tissues in six experiments, found the closure only temporary.

Brewer¹⁶ excluded the pylorus in nine dog experiments with an aluminum strip, finding the lumen non-patent at necropsy not later than two months and ten days.

Berg,¹⁷ Pool,¹⁸ Momburg,¹⁹ Corner,²⁰ Renton,²¹ Ward²² and Parlavacchia²³ have used a non-elastic ligature to occlude the pylorus, and report good results; but the large majority of men who have experimented with this method find that the ligatures rapidly cut through into the lumen and are passed along with the intestinal contents.

Infolding or kinking methods as practiced by Blad,²⁴ Mertens,²⁵ Sequinot²⁶ and Mariani²⁷ give only a temporary occlusion of the pylorus.

up the pylorus, thus permitting the lesion to heal while allowing the pylorus to become permeable after all danger of irritation of the ulcer is past.

I have seen W. J. Mayo and Mr. Moynihan infold with a purse-string, ulcers of the duodenum. Both seemed of the opinion that in this way temporary obstruction was produced and the value of the gastro-enterostomy enhanced. No theoretical deduction can be lightly weighed in the balance against any statement based on the practical results of two surgeons whose experience has been so rich and whose powers of logical deduction have proved so valuable.

A study of the intricate physiologic arrangement, which exists for taking care of the acid stomach contents inclines one to preserve the same in the absence of weighty reasons to the contrary.

Apparently the stomach contents are sharply divided for a long time into two parts. Unacidified salivary digestion may go on two hours in the cardiac half according to Pawlow.²⁸

The anatomic ground for this was suggested by Klemensiewicz,²⁹ who was the first to attempt isolation of the pyloric and fundus pouches, to get two pure secretions. In 1875 he excluded (bilaterally) a

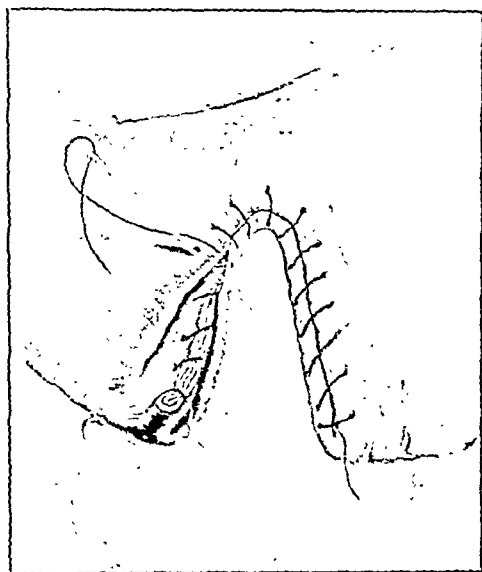


Fig. 4.—The step here described may be used instead of that shown in Figure 3. Here the first row of sutures described in Figure 2 is inverted in the ordinary manner, the V being left open.

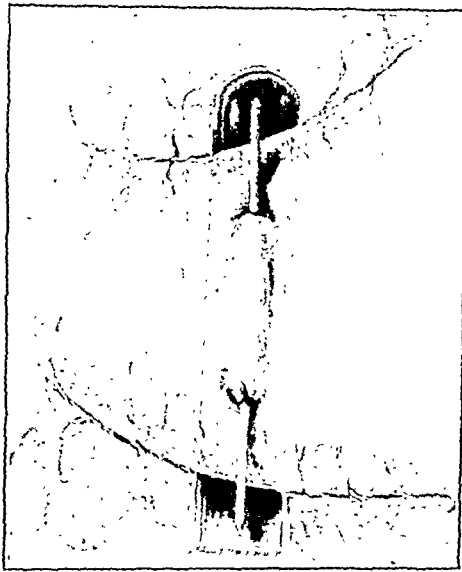


Fig. 5.—A spatula is thrust behind the stomach from below upper and a skewer driven through both walls of the viscus and out again, in such a way that it holds up about half of it when measured transversely. The highly vascular portion of the stomach is not interfered with.

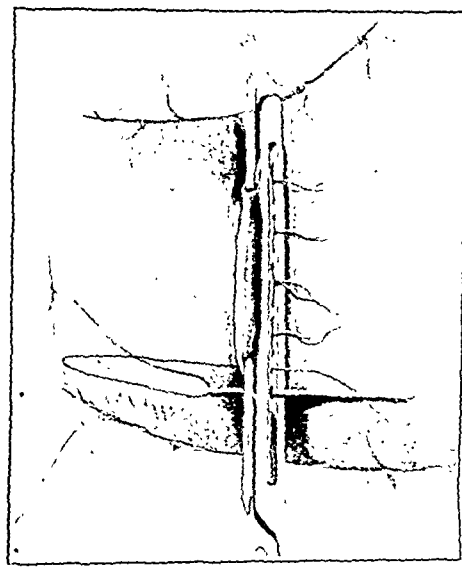


Fig. 6.—A slit clamp is applied behind the skewer and several mattress-sutures introduced through all the layers of the anterior and of the posterior walls.

Not a few workers in this field seem to be convinced that the best technic is that which temporarily closes

pylorus sack in the dog and withdrew an alkaline secretion. He kept no dog more than seventy-two hours. Heidenheim³⁰ kept one of six operated on thus for six months and got the same alkaline fluid with pepsin and rennin. He³¹ found that pyloric secretion had no effect on the wall about the fistula. Not satisfied with this knowledge, he³² isolated a fundus sack in eight dogs, kept one several weeks and withdrew a secretion containing pepsin and hydrochloric acid of higher concentration than the normal from a whole stomach (mixed with saliva and alkaline pyloric juice). It digested the tissues about his fistula.

Sick³³ withdrew through the tube, separately, the contents from fundus and pyloric portions. He found the two samples (in healthy stomachs) to be quite

4. Haberer: Arch. f. klin. Chir., 1913, c, No. 1.
5. Jonnesco: Revue. de Chir., 1907.
6. Jianu: Wien. klin. Wchnschr., 1910, xxiii, 1223. Girard: Verhandl. d. Deutsch. Gesellsch. f. Chir., Berlin, 1911, xi, 268. Leriche and Bressot: Lyon Chir., October, 1911. Leriche: Lyon Chir., 1913. Jianu and Grossman: Arch. f. Verdauungskr., April, 1910, xvi, 147.
7. See Footnote 6.
8. Küttner: Deutsch. chir. Kongr., 1913.
9. Kolb: Deutsch. chir. Kongr., 1913.
10. Bircher: Zentralbl. f. Chir., October, 1913, No. 40, p. 1547.
11. Hercher: Zentralbl. f. Chir., November, 1913, No. 44, p. 1707.
12. Hoffmann: Zentralbl. f. Chir., August, 1913, No. 40, p. 1331.
13. Göbell: Zentralbl. f. Chir., August, 1913, No. 40, p. 1332.
14. Wilms: Deutsch. med. Wchnschr., 1912, xxxviii, 101.
15. Naselli: La Clinica Chirurgica, May, 1913.
16. Brewer: Surg., Gynec. and Obst., 1914, xviii, 145.
17. Berg, A. A.: The Influence of Gastro-Enterostomy on Gastric and Duodenal Ulcers, THE JOURNAL A. M. A., March 22, 1913, p. 881.
18. Pool: Ann. Surg., 1913, lviii, 663.
19. Momburg: Zentralbl. f. Chir., 1913, No. 42.
20. Corner: Lancet, London, 1913.
21. Renton: Brit. Med. Jour., April, 1914.
22. Ward: Lancet, London, July 7, 1906.
23. Parlavacchia: Policlinico, Rome, April, 1910, xvii.
24. Blad: Ugesk. f. Laeger, 1912, xxv.
25. Mertens: Zentralbl. f. Chir., 1913, No. 40, p. 1545.
26. Sequinot: Thèse de Paris, January, 1913.
27. Mariani: Zentralbl. f. Chir., 1913, No. 44, p. 1706.

28. Pawlow: The Work of the Digestive Glands, London, 1910.
29. Klemensiewicz: Sitzgsber. d. Wiener acad., March 18, 1875.
30. Heidenheim: Arch. f. d. ges. Physiol. (Pflüger's) viii, 169.
31. Heidenheim: Hermann's Handbuch der Physiologie, Leipsic, 1881.
32. Heidenheim: Arch. f. d. ges. Physiol. (Pflüger's), xix, 148.
33. Sick: Deutsch. Arch. f. klin. Med., lxxxviii, 169.

different, physically and chemically. He got no or little hydrochloric acid from the pyloric portion, but obtained pepsin and rennin from it, though perhaps not so much as from the fundus.

In view of this knowledge, we must consider the pyloric antrum (as far as its secretion is concerned) as part of the intestine. Now many unfortunate experiences have proved that secondary jejunal ulcers are commoner, the lower, stomach contents are dumped into the bowel by gastro-enterostomy. In other words, the farther we go from the mucosa, in which acid secretion originates, the less automatic protection we find against its immediate effects.

We find far the greater part of all ulcers in the pyloric antrum and upper duodenum, regions which produce no acid, but which are regularly and frequently exposed to its action.

Cohnheim,³⁴ using from 6 to 8 cm. water, finds steady pressure on the contents of the fundus, while in the pyloric antrum, regular, powerful, peristaltic waves run along at regular intervals (six to the minute) according to Cannon³⁵ toward the pylorus and inject the food far into the duodenum.

Pawlow²⁸ agrees with Cannon³⁵ that it is the acid in

2. Closure of the pylorus itself cannot protect a gastric ulcer proximal to it, even in the presence of gastro-enterostomy, since the pyloric antrum drives stomach contents as far as possible toward the closed pylorus before letting it fall into the new opening. *Gastro-enterostomy alone* seems to have done less good the farther from the pylorus a stomach lesion has been found. However, my experience with unilateral exclusion of the affected area in such cases has been most satisfactory.

It takes the place of excision of gastric ulcer, or pylorotomy where the latter presents extreme technical difficulties.

A large ulcer perforating deeply into the structure of the pancreas, liver or other organs is most simply treated by exclusion.

It prevents the gastric contents passing over an ulcer; stops pain, prevents hemorrhage and puts the excluded portion at rest, allowing the ulcer to heal, thus decreasing the likelihood of secondary cancer.

3. Any form of exclusion of the pyloric antrum which prevents food passing over it accomplishes as much as does complete transverse division of the organ. Cohnheim teaches that the innervation of the

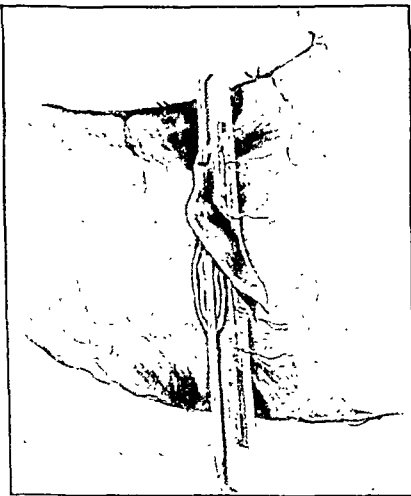


Fig. 7.—The skewer is cut out and the edges cauterized to avoid hemorrhage.

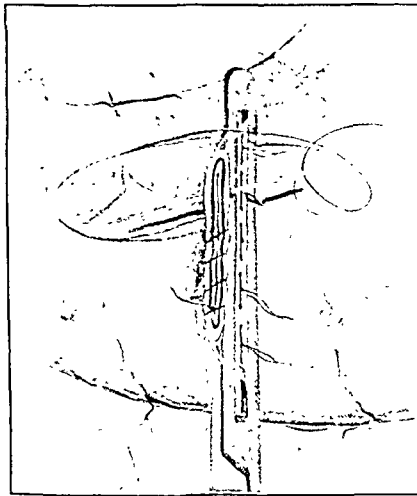


Fig. 8.—A hemostatic buttonhole stitch is introduced through all four layers.

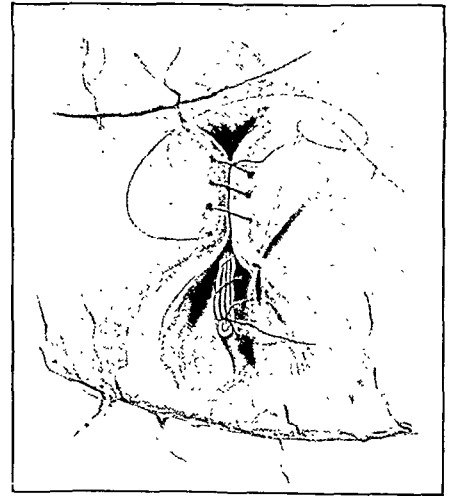


Fig. 9.—The cut surfaces are hidden by a row of Lembert sutures.

the duodenum which causes the pylorus to close and the gradual alkalinization of the duodenal contents to a given point which causes this sphincter to open again. One must, in view of such reasoning, hesitate *especially in the presence of high acidity* before permanently dumping stomach contents onto a mucous surface ill-prepared to receive the same.

CONCLUSIONS

1. Our real knowledge of ulcer is so meager at present that we are not prepared to deal with remedial conditions which do more than temporarily relieve the anatomic condition which is the expression rather than the origin of this disease. In the duodenum infolding (temporary obstruction) and gastro-enterostomy accomplish this without forever diverting stomach contents to a mucosa ill prepared to receive it. This is shown by a study of the enormous material of the Mayos and Moynihan.

stomach and pyloric musculatures is chiefly governed by automatic centers in the organ. This much is known although the exact action of the stomach's nerve mechanism is not understood. We cannot hope to stop secretion in the pyloric antrum by complete transverse division of the organ since Pawlow has shown that foods stimulate gastric secretion after the stomach is completely isolated from nerve connections, and hence through intrinsic ganglion by reflex nervous origin.

4. Both the methods I am proposing are simpler, take less time and encounter fewer blood-vessels than does transverse complete division of the organ. Experimentally they produced results similar to it, while clinically they seem to have been equally successful.

5. My first method (Figs. 1 to 4, inclusive) may seem the more convincing on theoretical grounds. The second (Figs. 5 to 9, inclusive) is the easier to perform and is less bloody, but it violates the time-honored principle that mucous surfaces are not to be approximated. The two methods seem to have given

34. Cohnheim, Nagel: Handbuch der Physiologie, Braunschweig, Ger. 1905-1909, Vol. II.

35. Cannon: Mechanical Factors of Digestion, London and New York, 1911.

equally good results in experimental work; the same seems to be the case in my clinical work, although this is not so easily ascertained. I leave the reader to choose between the two, after trying them.

400 Metropolitan Building.

ABSTRACT OF DISCUSSION

DR. WILLIAM L. RODMAN, Philadelphia: So many methods have been proposed from time to time to exclude the pylorus that we must agree that it is questionable if they do exclude. We know that the early methods which were introduced were absolute failures. Practically all methods except within recent years were looked on as failures, beneficial only for a time. So von Eiselsberg devised the radical procedure of cutting across the pylorus, sewing up the pyloric and the duodenal ends, thus making the two openings in the gastrointestinal tract to close. I am satisfied that the method described by Dr. Bartlett is excellent and, moreover, less mortality would follow his method than that of many others, and yet, he has had two deaths. The cases are too few, the time too short to say what the ultimate results will be, but I am inclined to agree with him that when the stomach is bound down by adhesions and a resection cannot be done, it would, perhaps, be well to use his second method. There would, I think, be less mortality than after the first. I have never performed pyloric exclusion, but if I do, shall use Dr. Bartlett's method, as it appears quicker, safer and seems to accomplish all that is accomplished by von Eiselsberg's operation. The question arises, Why operate, when, by removing a little more tissue than is removed in von Eiselsberg's operation, the ulcer-bearing area may be excluded. Dr. Bartlett's operation or any method of exclusion cannot prevent subsequent hemorrhage perforation or cancer of the stomach. There are, annually, 75,000 deaths in the United States from cancer, and more than 25,000 of them are from cancer of the stomach. Why shall we leave a lesion with so great potentialities in the stomach if it can be removed with practically the same mortality as these other methods, ingenious in a way, but which do not go to the root of the trouble? It has simply been from an exaggerated fear of the mortality. Is that justified? Recently, before the American Surgical Association, I reported a large number (375) of pylorotomies and partial gastrectomies done by American surgeons with a mortality of 4 per cent. I do not think one can do the von Eiselsberg operation with a smaller mortality and yet, in that operation, you are leaving the lesion behind. The fact stated by that great pathologist, Virchow, must be constantly kept before the mind, that 35 per cent. of all cancers in the human body are in the stomach. The time to operate on cancer of the stomach is when it is an ulcer. It has been conclusively shown that a vast preponderance of gastric carcinomas are preceded by ulcers. All precancerous lesions should be attacked radically, for in this way only shall we be doing our full duty.

DR. W. D. HAGGARD, Nashville: I have not applied Dr. Bartlett's procedure to the human subject but expect to use it in suitable cases. There have been many attempts to exclude the pylorus; the old ligature has been unsatisfactory. Dr. Bartlett's operation is simple and seems worthy of trial in some cases. I would not differ with Dr. Rodman in doing partial gastrectomy in suitable cases, but the surgeons of this country ought to reserve that for the extreme case. Now it cannot be denied that an operation of that magnitude in average hands is not going to be attended by the minimum mortality of 4 per cent. that has been gathered from the great clinics of the country. This Association is to establish certain lines of procedure for the average American surgeon. While it is true that of those cases of ulcer which develop cancer, 70-odd per cent. have developed on ulcer, it does not mean that all cases of ulcer will develop into cancer. Witness the very few cases that have ever been reported of a secondary malignant degeneration of an ulcer that has been operated on by gastro-enterostomy or any of the other well-recognized measures. Now, if, at the

time of operation, you are clinically or pathologically undecided as to whether or not the case is malignant, then Rodman's operation is the operation of election. It seems to me, however, that in the average case the principles laid down by Dr. Bartlett are the ones we should apply. Any measure that has just been introduced is, of course, going to have a hard voyage, but I do believe that if we practice this operation we shall find it applicable to a large number of patients who will do better than if we perform gastro-enterostomy.

DR. W. C. JONES, Chicago: What evidence does Dr. Bartlett have that his method produces complete pyloric obstruction? This point seems doubtful to me. I have been doing some experimental work with Dr. Carl Beck of Chicago, in making an artificial tube from the greater curvature of the stomach, using this tube for gastro-enterostomy instead of connecting the intestine with the unaltered stomach. In this work, the pyloric end of the stomach was narrowed as much or more than occurs in Dr. Bartlett's operation; yet we found by means of the Roentgen ray that the stomach contents passed largely through the pylorus. Passing a ligature around the pylorus did no good, as might have been expected. The most satisfactory and the simplest method we found of making the obstruction sure was complete incision of the pylorus and infolding of the cut ends. This procedure is very simple, is absolutely certain, and on the whole, leaves little to be desired.

DR. WILLARD BARTLETT, St. Louis: I was probably not understood when I stated that I had the stomachs from two necropsies and the stomachs of 17 or 18 dogs in evidence of the fact that the obstruction produced seems to be as complete as the operation of complete transversion with folding in of the ends. I cannot explain the difference, however, between this and Dr. Jones' method, but I shall be glad to study it.

A MICROCEPHALIC IDIOT WITH MALFORMATION OF BRAIN*

REPORT OF A CASE

ARTHUR K. PETERY, M.D.
NORRISTOWN, PA.

The case which I report is that of a patient who has aroused considerable curiosity among those who have seen him. The parents of the patient were interviewed by myself and furnished what information they could, freely and willingly. They appeared to be working people of the average intelligence, the father being 59 years of age, healthy, a blacksmith, a steady worker and a moderate user of alcoholics, though he has never been intoxicated. His mother is still living, aged 83, while his father died at the age of 62 from rheumatism. The patient's mother is living at the age of 55 and at present is passing through the menopause; she was the mother of eight children, who, with the exception of the patient, are all living and normal. She is strictly temperate in habits; her father was killed at the age of 38 in a railroad accident and her mother died at the age of 70, the result of heat exhaustion.

There is no history of any miscarriages, tuberculosis, malignancy or mental diseases in the family, and the only explanation that the mother can offer for the condition of the patient is that when she was four or five months pregnant they moved from one house to another, and she did a lot of hard work and heavy lifting, but was not injured and nothing unusual occurred.

REPORT OF CASE

Personal History.—The patient, the third child in a family of eight, was born April 17, 1884, at full term. "Birth was

* Read before the Philadelphia Psychiatric Society, March 13, 1914.

easy"; the child weighed about 6 pounds. The family noticed that the head was quite small and had "no openings on top," but thought nothing of it. The child was breast-fed to the age of 2 years when he was weaned, but it has always been necessary to feed him with a spoon. He never made any effort to learn to talk and first began to walk at the age of 3 years. He never walked a great deal, but when he did try, it was on his toes, never placing his foot flat on the ground. His condition first attracted the special attention of his parents at about the age of 5 years when they were told that the child would never talk or be of any account in the world. As soon as he was able to sit alone he would place his feet under him and when in bed would lie with the lower extremi-



Fig. 1.—Facial expression of patient in animation.

ties contracted. He constantly pounded with his hands on anything near him and the parents explain his large hands by this action. As he grew older he learned to know the various members of the family by sight; was usually good-natured, but at times showed a temper. When strangers came into the house he would notice the difference; would laugh and become noisy and excited.

It was always necessary to tie him to his chair, otherwise he would get into mischief by pulling things over and destroying them, and if the other children came within reach he would pull their hair with both hands, though he seemed to enjoy watching them playing about him. He was inclined to be destructive at every opportunity and if he found a small hole in his clothing would work at it until the garment was destroyed. He was never able to talk or to care for his personal wants.

Owing to illness in the family and a further inability on their part to care for him properly, he was taken to the Norristown State Hospital, Jan. 28, 1905; he was then 21 years of age. The records of the hospital at that time, while rather meager, state that he was an idiot and could not talk or walk, had to be fed, was unclean; quiet and did not make any sound. He weighed 65 pounds and was about 4 feet 2 inches in height. His chest was pterygoid in type, the lungs normal, the heart-action regular, but rapid; no murmurs were elicited; the pulse was rapid, but regular; the hands and feet were cold and cyanotic; he had abnormally long arms; the ears were quite large and head was small. He showed atetoid movements of the upper extremities. The muscles of the lower extremities were apparently paralyzed and showed contractures; the knee-reflexes were exaggerated and showed ankle-clonus; the pupils responded to light.

A review of his physical condition a short time before his death, Dec. 20, 1913, showed the following cranial measurements: biparietal, 12 cm.; occipitobregmatic, 13 cm.; occipitomenal, 20 cm., and cranial index 923. The head was covered by a loose thick scalp. The ears were quite large; palate arch high; the arms were rather long and the hands large and coarse. The fingers were heavily calloused from being continually bitten. The musculature of the lower extremities

was poorly developed and showed marked contractures; extremities were cold and cyanotic. The patient's actions were rather jerky. The chest was round with the sternum quite prominent; the left apex showed a cavity formation. The abdomen was apparently normal, while the genitalia were unusually well developed.

In appearance he resembled more closely a monkey than a human being and this led to his being called "the monk"; he might easily have been used as a specimen to carry out the Darwinian theory.

The ward notes as to his mental condition varied but little during his time in the hospital, the substance of them being that he was entirely helpless, unclean in his habits, usually dull, but at times appeared to observe what was going on about him, took no special interest in any one thing, would watch people going about and could be attracted by strange noises such as the dangling of keys, etc., when he would look toward the source of the noise. He was always more or less destructive and would tear his clothing, using both hands in doing so. Frequently would hold the cloth with one hand and tear with the other.

About April, 1913, the ward physician was able to interest several of the other inmates in this patient's condition in an effort to observe just what effect constant personal effort in the patient would bring out. These inmates devoted most of their time to him and would perform all sorts of antics for his amusement. Gradually he appeared to watch them, and would become excited, jump in his chair and laugh at their actions; at times would grunt as if in an effort to speak; he also seemed to know these particular men, for when they would approach him he would become excited, but when a stranger approached he paid no attention and hung his head.

These men would also throw a handkerchief to him and he gradually learned to watch for it, catch it and then throw it back, but without any definite direction; at times they would cover his head with it and he would pull it off and throw it at times with one hand, and again the other, and seemed to wait for them to replace it, apparently enjoying its performance. He would only do these things, however, with the persons with whom he was acquainted. Generally, he became much brighter and watched any moving object and at times would become quite noisy, and this state continued until his final breakdown and death.



Fig. 2.—Lateral view of brain.

Post-mortem Findings.—The head is covered by short thick brown hair. The scalp is thick, average 8 mm., contains much fat, and shows many transverse folds. The epicranium is thick, white and tough. The skull is hard and contains a fair proportion of diploe. It measures 5 mm. in thickness in the frontal region, 2 mm. in the parietal region, 9 mm. in the occipital region. All the sutures are indistinct, in places entirely obliterated. The dura is generally a little thick, but strips from the calvarium readily. The internal measurements of the skull, at level of section, are 10.5 cm. anteroposteriorly, and 8 cm. transversely at the parietal eminences. The anterior basal fossa measures 3 cm. anteroposteriorly, 3 cm. transversely at the widest portion, and is perfectly flat. The

middle fossa measures 5 cm. anteroposteriorly, 3 cm. transversely, 1.5 cm. in depth. The posterior basal fossa measures 3 cm. anteroposteriorly, 4 cm. transversely, and 2 cm. in depth. The pia-arachnoid is slightly opaque over the sulci, and here the subarachnoid space contains an excess of fluid. The brain is extremely small. The posterior lobes do not cover the cerebellum and the latter protrudes 1 cm. behind the occipital pole on the left side and 1.5 cm. on the right side. The cerebral hemispheres measure 9 cm. from frontal to occipital pole and 4 cm. in width. The convolutions are rounded and extremely elementary and vary considerably in width. The fissure of Sylvius is well defined. The posterior limb extends upward and backward, reaching the neighborhood of the great longitudinal fissure just behind the middle of the superior edge of cerebrum. Its course closely resembles that of the normal fissure of Rolando. There is depression at the site of the ascending limb of this fissure. A well-defined fissure lies anterior to the posterior limb of the sylvian fissure on the left side, which probably corresponds to the rolandic fissure. From this, two short fissures run at right angles, probably corresponding roughly to the upper and lower frontal fissures. The right frontal lobe is similarly marked, but less distinctly. The orbital surfaces of the frontal lobes show two short, shallow anteroposterior sulci, separating

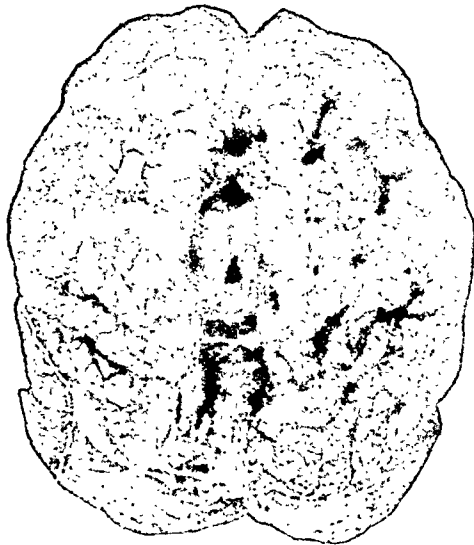


Fig. 3.—Looking down in hemispheres. Note absence of corpus callosum.

it into three convolutions. The olfactory bulb and tract are small. The trigonum olfactorium is larger and more distinctly formed than normally. The temporal lobe is rather well defined. Three horizontal fissures run roughly parallel to the sylvian fissure. The superior temporal fissure is well defined. There is a distinct supramarginal and angular gyrus. A small depression probably corresponds to the intraparietal fissure. On the mesial surface of each hemisphere, one irregular sulcus is seen, corresponding to the callosomarginal fissure, which approaches the superior edge of the hemisphere behind the position of the sylvian fissure. No distinct parieto-occipital, calcarine or parallel fissures are found, so that it is impossible to define the mesial and lower aspects of the parietal and occipital lobes. The hippocampal convolution is also poorly defined, but wide. There is one depression in the lower surface of the temporal lobe near the temporal pole. If this marks the width of the uncus, this convolution measures 1.5 cm. in width and is the widest convolution of the brain. Elsewhere the convolutions measure 0.5 to 1 cm. in width.

No corpus callosum connects the hemispheres, the pia-arachnoid of which was slightly adherent. The pia-arachnoid is reflected from one hemisphere to the other, and beneath this a thin membrane, apparently the tela choroidea, is seen. When this is incised the third ventricle is exposed. The fornix is not fused and can be seen over each thalamus, running anteriorly and downward as the descending pillars. The cortex lies close to the fornix above. No anterior horn of the lateral ventricle is apparent and the head of the caudate nucleus is not seen. At the normal position for the foramen of Monro, beneath the descending pillars of the fornix, fringes of the choroidal plexus are found, likewise on the under surface of the velum interpositum, in the midline. The thalami are seen, also the anterior, middle and posterior commissures, the region of the habenular nuclei, a small pineal body, and corpora quadrigemina.

Sections of the right hemisphere show the absence of the anterior horn of the lateral ventricle. The caudate and lenticular nuclei, internal and external capsule, claustrum and optic thalamus are in normal relations. The lenticular nucleus is relatively large. The posterior and inferior horns of the lateral ventricle form one large horn extending from the level of the surface of the optic thalamus. The shelving fornix and the choroidal plexus extend downward into the temporal lobe. A distinct small cornu ammonis is present. The cerebral cortex varies from 2 to 4 mm. in width.

The cerebral peduncles and pons are small, but the whole medulla is relatively large, approaching the normal adult size. The cranial nerves appear at their normal positions and are small, except the third and fifth, which are relatively thick. The pituitary body is relatively large, and of normal size. The circle of Willis and vascular supply are normal.

The cerebellar hemispheres measure 45 cm. anteroposteriorly by 4 cm. transversely. In gross appearance, both the vermis and hemispheres are normally marked and small, but not in proportion to the cerebral hemispheres. The brain weighs 220 gm.

The preceding description is based on a comparison with the normal adult brain. The scale of development, compared to the brain of the monkey and ape has not been sufficiently studied. Dr. E. A. Spitzka states that the brain is as small and elementary in cortical development as he has seen in a human brain. He believes that it has no distinct occipital lobe and agrees that it is incallosal. The cortical development is much below that of the higher apes. A more complete comparative and pathologic study of the brain will be undertaken and reported.

For the preceding report of the necropsy I wish to express my appreciation to Dr. Charles J. Swalm, Pathologist to the State Hospital.

FUNDAMENTAL INTRAPELVIC PERINEORRHAPHY*

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CHICAGO

Friedrich Schatz¹ in 1883, standing chiefly on the work of Luschka,² it appears, was the first gynecologist to point out in detail the anatomy of the female pelvic floor in general and that of the levator ani in particular, to define its functions and to describe the injuries which it receives, chiefly during parturition, in its posterior, lateral and anterior sections. He makes it clear that injury of the levator ani may occur independently of the perineum (submucous tears), but more usually with tears in the latter, and that truly intrapelvic work is needed to accomplish the best that can practically be done with them. The next most notable promotion of the subject occurred in 1889 by R. L. Dickinson,³ who corrects some misconceptions of the anatomy and presents the results of tests of the contractile power and lifting capacity of the levator ani. The results of these tests I regard as necessarily due partly to the concurrent actions of the bulbocaver-

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

* This article has been abbreviated by the omission of some of the illustrations. The article will appear in full in the Transactions of the Section and the author's reprints.

1. Schatz, Friedrich: Arch. f. Gynäk., xxii.

2. Luschka: Das Becken.

3. Dickinson, R. L.: Am. Jour. Obst., September, 1889.

notus muscles and inner borders of the trigon, that could not be excluded.

Next, Charles P. Noble,⁴ in 1897, published a method in which he made a modified Emmet denudation and passed interrupted sutures transversely, taking in the vaginal wound edges with those of the levators beneath, with the aim to attach the latter to the former rather than to unite the levator borders. After this, in 1901, I⁵ emphatically reiterated the superficial character of all the former standard perineorrhaphies and dwelt on the necessity of utilizing the more

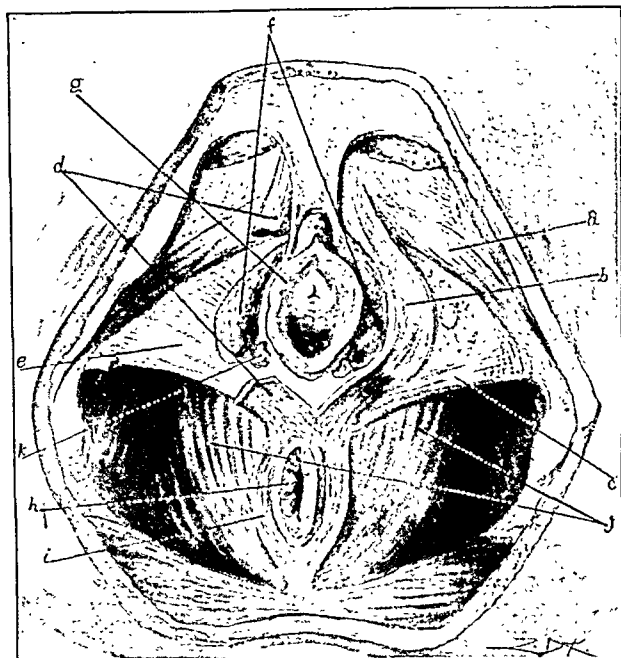


Fig. 3 (Plate 13 of Edward Martin's Atlas).—Labia, skin, subcutaneous fat, superficial perineal fascia and contents of the ischioanal fossae removed. The ischiocavernosus (a), bulbocavernosus (b) and the superficial transverse perineal (c) muscles (belonging to the superficial stratum) are intact on the left side; but the latter two are cut away (d) on the right side to expose the urogenital trigon (e) on that side. The bulbi (f), Bartholin's gland (g), vulva (g), and the anus (h), with the external sphincter (i), are intact. The levator ani (the innermost stratum) is divested of its outer fascia.

deeply seated but available portions of the levator ani and its fasciae, by true intrapelvic operating. I described and illustrated the various steps of an operation performed by myself for six years previously. During the past twelve years, most operators have obviously modified their former methods with an effort to engage the levator ani (with doubtful success), and a goodly number have abandoned their old methods entirely for a new and modern technic, professing to deal with the levator ani efficiently. While this has been achieved by some, in more instances it is evident from their descriptions and illustrations that they have mistaken some more superficial structures for the levator ani. This is one reason why I am again speaking on this subject, after a pause of thirteen years. A second is that recent and greatly superior anatomic studies and publications on the female perineum need to receive more general recognition, and a third reason is that the importance of the fasciae in the woman's perineum and pelvic diaphragm is recognized and emphasized by only few clinicians in their writings. The new and superior anatomic works referred to are by Halban and

Tandler,⁶ W. Liepmann,⁷ Hugo Sellheim⁸ and Edward Martin.⁹ Waldeyer, Holl and Rieffel, whose authority is largely recognized in these newer studies, divide the female perineum and pelvic diaphragm grossly into three layers from within outward:

First, the principal part, a shallow funnel-shaped muscular layer (Fig. 4) composed of coccygeus and levator ani muscles, is invested on the upper or visceral side by a layer of pelvic fascia, called fascia endopelvina by some and rectovesical fascia by Gray; and on its lower or peripheral surface by another layer of pelvic fascia called the ischioanal or anal fascia by Gray, it having a connection with the upper sphincter. This main portion of the pelvic diaphragm is usually clearly shown in most anatomies and particularly in Figure 4. The levator ani is subdivided by some into the ischiococcygeus, ileococcygeus, pubococcygeus and puborectalis muscles. It is the latter that is chiefly engaged in plastic restoration of the injured pelvic floor.

The second layer, the urogenital diaphragm or trigon in the male perineum is clearly set forth in our general anatomies; but in the female perineum it is dismissed with a mere mention of a triangular ligament, but no proper conception at all is given as in the anatomic studies above mentioned (Figs. 2 and 3), that in the female there is also a virile urogenital diaphragm or trigon composed of two potent layers of fascia, the outer one being even aponeurotic, with

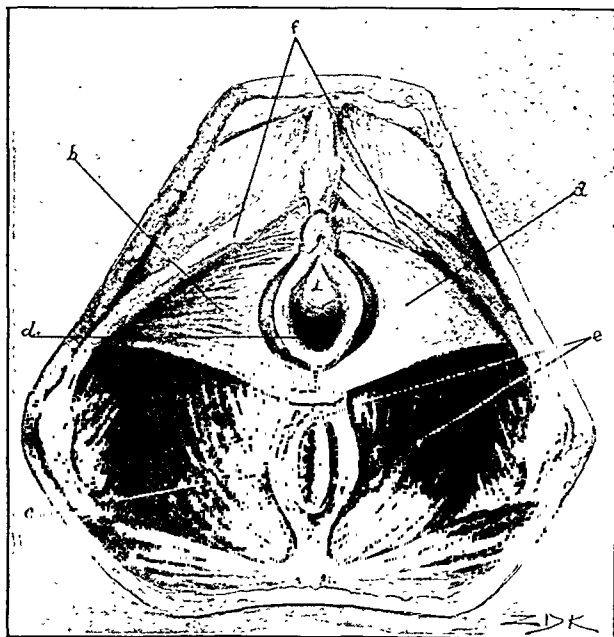


Fig. 4 (Martin, Plate XIII).—Chief muscles of the outer stratum or layer and the bulbi removed. The urogenital trigon (the middle stratum) composed of two layers of fascia with muscles between them, is intact on the left side (a), but has the outer aponeurotic layer removed on the right side, to show the fibers of the transversus perinei profundus (b) within. The anus (c), the vulva (d) and the levator ani (e) are intact as before. The crura of the clitoris (f) are shown, the left one in its relation to the ischiocavernosus muscle.

the muscle of the urogenital trigon (or transversus perinei profundus) between them. This composite

6. Halban and Tandler: Anatomie und Aetiologie der Genitalprolapse beim Weibe, Vienna and Leipsic, Braumüller, 1907.

7. Liepmann: Atlas der Operations: Anatomie und Operations Pathologie der weiblichen Sexualorgane, Berlin, Hirschwald.

8. Sellheim, Hugo: Deutsche Frauen-Heilkunde, I, Die Geburt des Menschen, Wiesbaden, Bergmann.

9. Martin, Edward: Der Haftapparat der weiblichen Genitalien, Berlin, Karger.

4. Noble, Charles P.: Am. Jour. Gynec. and Obst., April, 1887.

5. Goldspohn, Albert: Am. Gyn. and Obstetrical Jour., June, 1901.

fascial and muscular plate, closing the pubic angle formed by the descending rami of the pubis and ascending rami of the ischium, reinforces the levator ani from below. Like the latter, it has a median urogenital aperture whose borders are firmer, more distinct and less yielding than are the borders of the genital cleft of the levator. It composes the trigon in the female perineum, and beneath it lie the subfascial (superficial) muscles—the superficial transversus perinei, the ischiocavernosus and the bulbocavernosus composing the *third layer* (Fig. 2). The bulbocavernosus, surrounding the vulvar opening, reinforces the inner margin of the trigon; and these together are what some operators have mistaken for the levator ani, whose anterior median edges lie farther within, are less distinct and extend more in an inward and upward direction. This mistake is apparent from the illustrations and described technic of Robert T. Morris,¹⁰ Arnold Sturmdorf,¹¹ C. A. Hall,¹² George B. Somers¹³ and C. W. Barrett.¹⁴

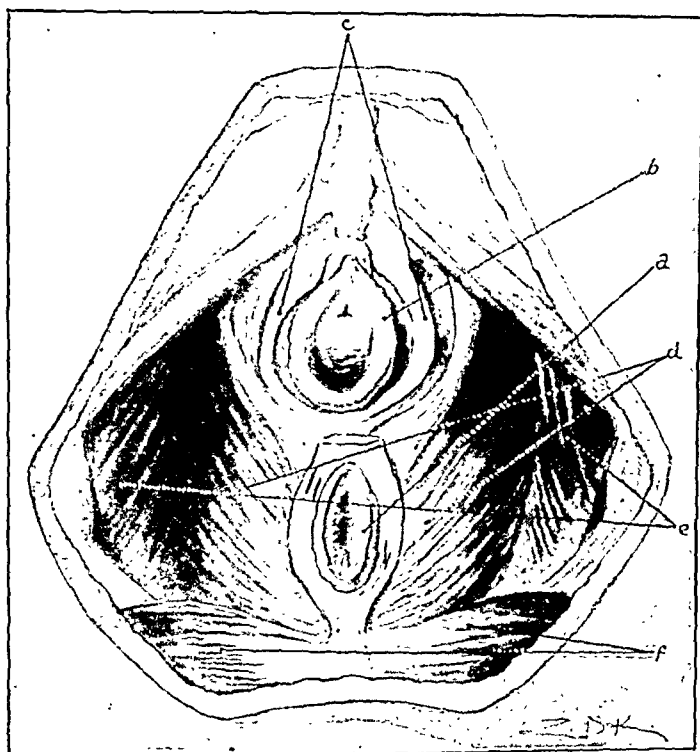


Fig. 5 (Martin, Plate XIV).—All the structures of the superficial and of the middle strata removed up to the margins of the rectum (a) and vagina (b), that have been carefully preserved, the latter as a projecting collar, which is surrounded by the remaining edge of fascial trigon (c). The ischioanal fossa have been cleared out and the muscles composing their walls—the levator ani (d), the internal oblique (e) and the pyriformis (f)—have been divested of their fascial covering.

Edward Martin has made some of the best dissections and sections *en masse* of hardened female pelvises under the direction of Waldeyer. Copies of some of his plates are here presented. He says, "The distinct edge which is felt in the vagina is not the levator edge, but the inner border of the urogenital diaphragm," that is, the fascial trigon. The levator ani lies beyond this structure farther within the pelvis, more like a curtain hanging down over the lateral bony walls of the pelvis. The needle or sharp volsellum that picks it and its fasciae up right will sometimes hook into the periosteum beneath it, and will then require releasing a little. These bilaterally receded parts of the levator

that we need to bring together and unite in the median line back of the vagina and in front of the rectum always lie from 4 to 5 cm. or more away from the muco-skin junction, where the operation begins; and their efficient union requires that a flap of posterior

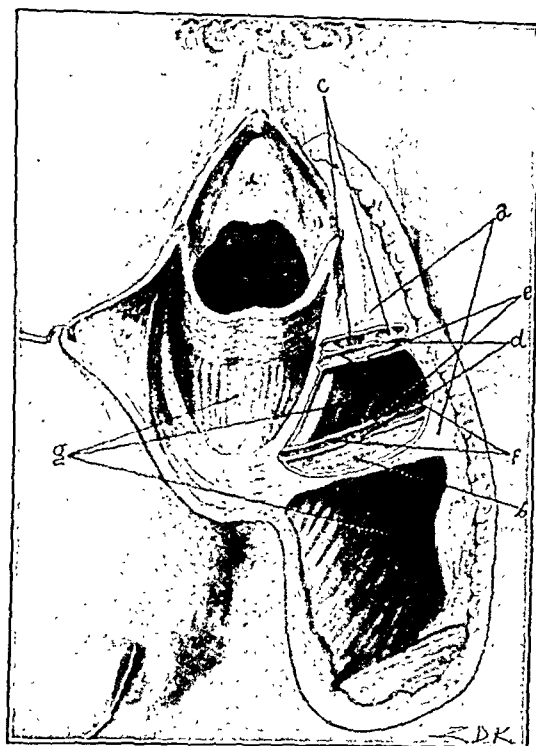


Fig. 6 (Martin, Plate XV).—Section showing the three main strata of the structures in the female pelvic floor, and the three layers of the trigon (middle stratum); a, superficial fascia; b, superficial transversus perinei muscle, and c, sections of bulbocavernosus and ischiocavernosus muscles, composing the outer stratum; d, the outer fascia (aponeurosis) of the trigon; e, inner fascia of the trigon; f, transversus perinei profundus muscle lying between these fasciae and completing the trigon (middle stratum); g, the levator ani, the innermost and chief stratum.

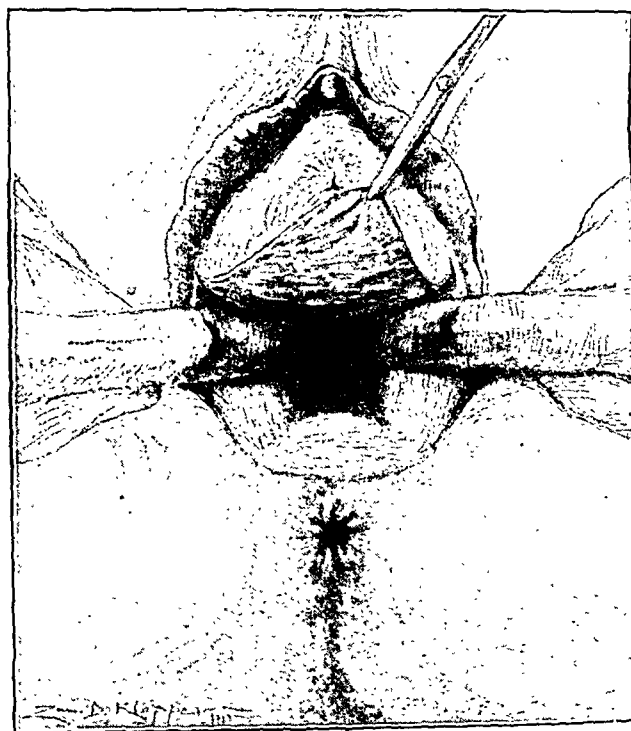


Fig. 9.—The posterior vaginal wall must be raised to a distance of from 7 to 8 cm. inward, and laterally to the level of the white line in the pelvic fascia of each side.

vaginal wall be raised extending from that line inward at least 6 to 8 cm. and laterally near to the arcus tendineus or white line in the pelvic fascia. These deep-seated receded parts of the levator ani with its fasciae are best caught up on each side and drawn

10. Morris, R. T.: The Female Perineum from a General Surgeon's Point of View, THE JOURNAL A. M. A., May 18, 1912, p. 1508.
11. Sturmdorf, Arnold: Am. Jour. Obst., September, 1912.
12. Hall, C. A.: Surg. Gynec. and Obst., February, 1909.
13. Somers, George B.: Repair of the Perineum, THE JOURNAL A. M. A., Nov. 11, 1905, p. 1462.
14. Barrett, C. W.: Am. Jour. Obst., April, 1909.

toward the median line preliminary for suturing, by curved volsellum forceps with semisharp teeth, so as to avoid puncturing hemorrhoidal veins unnecessarily, the rectum being held out of the way by the index-finger of the left hand.

Union of these parts thus brought into view is made by three or four turns of continuous or interrupted strong sutures of catgut chromicized or treated with formaldehyd, the third and fourth of which and all succeeding sutures catch enough of the areolar tissue over the rectum below and beneath the vaginal flap above to obliterate the dead spaces and to gather the broad vaginal flap into small anteroposterior folds and to fasten it sufficiently on top of the newly made bridge of levator beneath. The fasciae of the levator are really the most important part in the bridge, as its comparative inelasticity shows when it is thoroughly made. All of this bridge, if it is really composed of levator ani, will be within the pelvis beyond the more prominent and palpable ridges or strands that are commonly felt in the perineum passing up along the sides of the lower section of the vagina.

As the suturing of the wound continues from the bridge mentioned above downward, these inner edges of the fascial trigon, as the second layer in the pelvic floor, are also united, and likewise the bulbocavernosus and transversus perinei muscles (of the third layer) that should coalesce in the tendinous center of the outer perineum in front of the rectum. The technic of the operation in detail is shown in the illustrations. Suffice it to say that the buried sutures, whether interrupted or continuous (with a tie at every third or fourth turn), should not penetrate the vaginal flap,

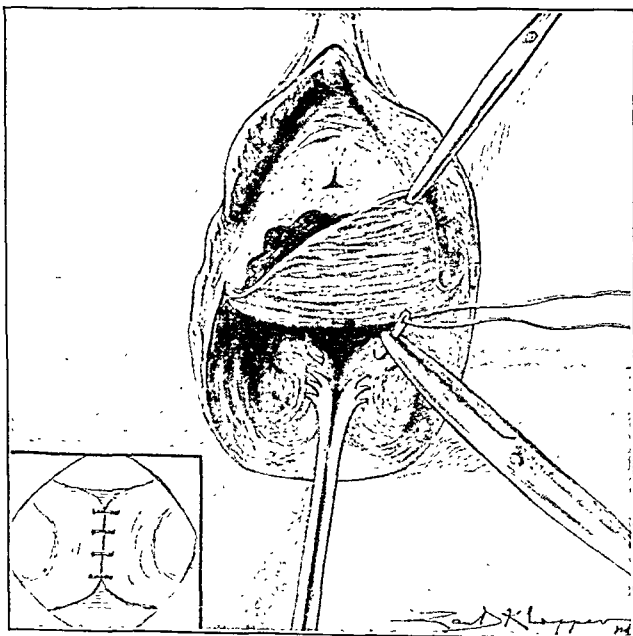


Fig. 10.—The corresponding portions of the levator ani with its fasciae are each caught up from the bony walls of the pelvis at a depth of from 5 to 8 cm. within, by a semisharp volsellum forceps curved sidewise. They are approximated and separately united near the median line, by three or four interrupted or continuous strong catgut sutures.

but merely catch into the submucous tissues beneath it. No figure-of-eight sutures should be employed anywhere in this operation.

In cases of complete tear through the sphincter ani, the operation, first suggested by a German for this injury, is first performed as follows: A shallow inci-

sion varying in outline between an inverted V and a semicircle is made from a little outside of the point of retracted sphincter end of one side to the corresponding point or sphincter end on the other side, and at a distance of from 1.5 to 2 cm. away from the edge of the tear in the rectum. From this curved line downward to the border of the tear a thin flap is very carefully dissected up without perforations, and turned downward over the cleft in the sphincter and rectum

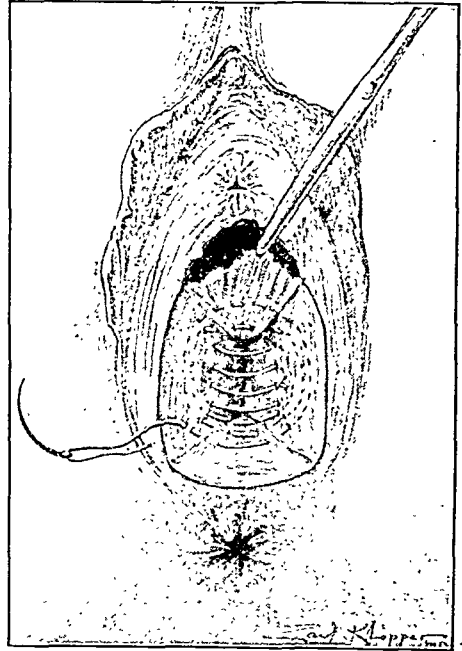


Fig. 11.—After the levator has been sutured separately, the remaining wound is closed from side to side, from within outward, by continuous catgut sutures passed circuitously and knotted at every third or fourth turn, and the skin wound is closed vertically by interrupted silkworm-gut sutures.

to protect all sutures from contact with the bowel lumen or its mucous membrane. The raw surfaces and exposed ends of torn sphincter are then brought and united together by interrupted catgut sutures, over the raw surface of the flap. It is well to place a silkworm-gut suture in the rectovaginal septum beyond the first incision to relieve the tension on the other sutures.

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CHIEF FACTORS IN FAILURE OF OPERATIONS FOR RETRODISPLACEMENT OF THE UTERUS*

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BROOKLYN

This paper makes no pretense to novelty. It is just an emphasis on things said before. I like to ask "why," to dig up causes and to handle them with bare hands, and so I present just a few facts, recall a few failures and make a few suggestions.

First, the facts. They are alphabetic, but one needs initials to spell so big a word as "success."

* Read before the Section on Obstetrics, Gynecology and Surgery at the Sixty-Fifth Annual Session of the Association, Atlantic City, N. J., June, 1914.

I. ANATOMIC FACTS

The first group of facts is anatomic.

1. The normal uterus is a freely movable organ and is suspended in the pelvis between the abdominal cavity and the pelvic floor by the harmonious action of its several supports, that is, (a), the pelvic floor; (b), the adjacent pelvic organs; (c), the retentive power of the abdominal cavity; (d), the several ligaments, and (e), the normal relation which the uterine axis bears to the axis of the vagina.

In the erect posture of the woman, bladder and rectum being empty, the os externum is in the plane of the ischial spines, or a little below it and slightly posterior to a central position in the pelvis. The cervix projects into the vagina and is directed toward the last sacral vertebra, and is held in this position by the uteropelvic and the uterosacral ligaments, and the vesicovaginal fascial plate. The upper and posterior aspect of the fundus is at or a little above the level of the plane of the brim. The axis of the uterus is at nearly a right angle with that of the vagina, the body resting on the pubic (fascial) shelf.

The axis of the uterus has a wide range of inclination dependent on the degree of fulness of the bladder and rectum. With bladder and rectum moderately full the uterine axis conforms to the axis of the pelvis. With the bladder empty the axis of the vagina is almost horizontal and runs almost directly backward, while the uterus is directed forward at an acute angle and is in a position of marked anteversion, slightly ante-flexed. The attachments of the uterus are for the most part of yielding character which allows great freedom of motion in all directions, rising and falling with the respiratory movements and changing its position with the different positions of the body. A full rectum pushes the uterus bodily forward and a full bladder displaces it backward.

The ligamentous supports of the uterus are the round ligaments, muscular bands covered with peritoneum which tend to hold the fundus forward, acting as "guy-ropes" to prevent it from falling backward.

The uteropelvic ligaments, which consist of bands of muscle-fibers running outward from the supravaginal portion of the cervix to the pelvic fascia within the base of each broad ligament, prevent the uterus from undergoing lateral changes in position and help to sustain it in its proper plane.

The broad ligaments, which act in some measure to steady the uterus in or near the median section of the pelvis, and the uterosacral ligaments made up of muscle and cellular tissue and covered with peritoneum, pull the cervix upward and backward and prevent its downward displacement.

The pelvic floor, which preserves the position and integrity of all of the organs and soft parts of the pelvis, indirectly supports the uterus. The pelvic floor, the uterosacral ligaments and the uteropelvic ligaments are the chief supports against downward displacement.

These facts are recalled mainly to rivet our attention on this fundamental fact—that nature has provided women with these ligaments and supports for certain definite purposes, and when such supports and position are at fault it is the duty of the gynecologist to determine before operation what are the digressions from the normal.

II. HISTORICAL FACTS

The second group of facts is historic. The pioneer work in this department of gynecology was done by

Alquié about 1840. More than a quarter of a century afterward came Koeberle, 1869; Adams, 1880. The real work in this line, however, originated with Alexander, when in 1881 he performed his first operation, reports of which he published in 1884. In 1886, Kelly and Ohlshausen devised intra-abdominal operations for suspension of the fundus. Wylie, in 1886, intra-abdominally shortened the round ligaments for retro-deviation, and reported his cases in 1888-9; and in 1889 Freund shortened the uterosacral ligaments. More recently we have plication of the round and broad ligaments after the method of Coffey; also plication of the vaginal wall after the method of Emmet-Baldwin.

These were the pathfinders in our specialty, and although there have been a multitude who, since their work, have cried "lo! here" or "lo! there," I am persuaded that every procedure in operating for retro-displacement is only a modification or adaptation of the procedure of one of these six primary methods.

III. FAILURES

And now as to the failures; but why speak of failures? Because, they are facts, big, bulky facts which ought not to be, and again because they are our most efficient if not our most delightful teachers. In the world of economics the word to conjure with to-day is "efficiency," and as we analyze the curriculums of the schools of commerce where this new science is being studied, we discover that the student is taught that waste is worth while, that every failure has a cash value. Let us liquidate ours and we have a goodly asset in this department of surgery. The proportion of failures was brought very forcibly to my attention at a recent meeting of the New York Obstetrical Society, at which time a symposium was held on "The End Results of Operations for Retrodisplacement within the Last Five Years," done by different notable gynecologists at the various hospitals in Greater New York. A summary of the results of this symposium is soon to be published in the *American Journal of Obstetrics*.

And now what is the cause of our failures? First, a plain neglect of the alphabetic facts of anatomy such as I have summarized above, a failure to take counsel with Nature's simple physiologic mechanics. Secondly, what might be called a passion for originality, in which the enthusiastic operator permits himself to be obsessed with his own idea to the forgetfulness of the work done by the pathfinders in our department.

The following points should be passed on before determining what shall be the operative procedure in a given case:

1. What is the age of the patient? If the woman is in the child-bearing period, no operative procedure should be undertaken which will cause any interference with pregnancy; whereas, if the woman is past the menopause, the simplest operative procedures which will hold the cervix upward and backward and the fundus forward should be undertaken.

2. What is the condition of the pelvic floor? It is trite to say that it is absolutely essential that a corrected or overcorrected pelvic floor of a firm muscular type, as for instance an Emmet-Holden, must accompany any operative procedures for retrodisplacement when there is a relaxed pelvic floor existing.

3. What is the position of the cervix, and can it be replaced up in the hollow of the sacrum? It has been interesting within the last year or so in Dr. Polak's Clinic at Long Island College Hospital, to see

the number of cases in which we have not, on discharge of the patients from the hospital, found the uterus in an anatomically perfect position. On investigation we have almost universally satisfied ourselves that the reason for such disappointment has been that we had a cervix which did not go backward when the fundus has been brought forward by the operation which we had selected for the given case, and on further observation we are satisfied that in these cases we have not achieved the desired result, because we did not appreciate the fact that there was a congenital short anterior invagination of the cervix which prevented it from taking its normal position, even though there was a firm pelvic floor and the fundus was brought well forward. Such cases we have time and time again seen recur. It is the information gained from this particular type of case which stimulated me to thought with reference to failures, and if possible by analysis to minimize my own failures.

Reynolds, in his original article "Anteflexion of the Cervix and Spasm of the Uterine Ligaments in Relation to Retroversion, Dysmenorrhea and Sterility," dated May, 1911, read before the American Gynecological Society, called attention, in connection with the treatment of sterility, to the advantage to be gained by lengthening the anterior vaginal wall and thereby allowing the cervix to be placed in normal position. I am of the opinion that Reynolds' article has not received the attention of which it was worthy, and so the facts of his procedure have not been appropriated to the correction of retrodisplacement of the uterus. With this idea in view I have tried to emphasize the advantages to be gained by the Reynolds' operation in conjunction with other operative procedures. I say advisedly that long ago the pioneers in this department of surgery laid it down as primary that, it matters not how far forward or by what method the fundus is brought anteriorly, cases will recur if the cervix is not placed upward and backward in the hollow of the sacrum, and my own observation goes far to commit me unqualifiedly to the same conclusion.

To be practically specific and illustrate the reasons for frequent failure, I mention the following complications and failures in some of the well-known methods which we have used:

1. The Webster-Baldy operations: Two tubal pregnancies due to angular constriction of the tube in its isthmic portion arresting the impregnated ovum in its transit to the uterus.

2. Lateral version of the uterus, due either to unequal primary development of the ligament, present but unnoticed or unappreciated at the time of operation, or to torsion of the ligament from defective technic.

3. Large ovaries slung over the encircling band formed by the round ligaments tend to fall low in the pelvis by lengthening of the utero-ovarian ligament, and become adherent to the posterior surface of the uterus or broad ligament.

4. The sigmoid may become adherent to the ligamentous loops, causing left-sided pain and digestive disorders.

5. The ligaments passed behind the uterus may become edematous from constriction and offer an inflammatory surface for intestinal adhesions.

6. Ovarian enlargement as a result of venous stasis of the broad ligaments.

7. A large uterus may sink in the pelvis through the encircling ligamentous loop and the ovaries are

carried upward and to the median line and thereby become adherent to one another, forming a sensitive mass on the posterior wall of the uterus.

In the 437 Webster-Baldy operations performed by Polak and his associates, twenty-six patients had thrombosis of the pelvic veins, which had extended to the femoral and saphenous. The type of cases in which we have used this operation successfully is that in which there is a small uterus and two well-developed round ligaments.

Coffey plications of the round ligaments have been followed by the following complications: exudates in the uterovesical space and painful uteri with limited motion. Dyspareunia has been one of the chief complaints.

In the two cases in which the abdomen was reopened the pathology was interesting; in one the uterus was prolapsed and hanging from the anterior vaginal wall by two ribbon-like bands, the round ligament was not appreciable, being similar to those bands found after simple ventrosuspension, while in the other case the uterus was buried in adhesions.

This operation is useful in covering over raw surfaces on the anterior uterine wall after myomectomy, etc., in conjunction with a uterus which tends to sag backward.

The chief objection we have found in the operation is that it brings the whole organ forward in the pelvis yet does not exaggerate the anteversion and subsequently the cervix slides up under the symphysis followed by the backward displacement of the fundus.

We have had a number of failures by the Gilliam, and the Montgomery-Gilliam, for the reason that the cervix is not carried up into the hollow of the sacrum.

When prolapse is associated with retrodisplacement in a woman near or at the menopause the transposition operation has been very satisfactory. The Emmet-Baldwin plication of the anterior vaginal wall has been done very seldom but is considered a very satisfactory procedure because it places the cervix well backward and upward.

IV. CONCLUSIONS

It is obvious that I have only gleaned in the field which stretches to the horizon of surgery, but this much grain may be gathered from what I have gleaned.

1. The gynecologist must be strong in the grace of discriminating; he must receive as alphabetic the proposition that the cervix must be placed upward and backward in the hollow of the sacrum.

2. No one operation already devised or to be devised will cure all sorts and conditions of cases. As individual as is the patient, so individual may be the patient's displacement, and this element of individuality must be seen clearly and bulk large in the operator's diagnosis—hence, the absolute necessity for the fundamental grace of discrimination.

I beg leave to report a personal interview which I had with an operator of note two years ago, at which time I asked the following question, "Do you do your operation on all cases of retrodisplacement of the uterus?" and the answer was in the affirmative.

The gynecologist must possess in a great degree the grace of self-elimination. The passion for spurious originality must be brought to heel like a well-broken dog. In my opinion the six procedures recalled in the historical survey, with the addition of the Reynolds operation in those cases in which a short anterior invagination of the cervix exists, present a sufficient

number of points of departure for, loosely speaking, every case. Given an intelligent appreciation of the essential element in each one of these six alphabetic procedures one is on the line of approach to the cure of every case.

3. Adaptation, modification and synthesis. Having made his selection of the main procedure it remains only for the operator to apply that procedure which with its individual modifications is called for by the case before him. The opportunity for modification is infinite, as various as the cases themselves. The modification may consist of an exclusive use of one of the main procedures, or by synthesis of the whole or part of two or more of the main procedures. In short, success in this particular operative field, and that must always mean success for the individual patient, is to be achieved by an unqualified commitment to fundamental anatomic facts, by elimination of self and by adaptation of existing procedures to individual cases by a process of modification and synthesis.

158 Lincoln Place.

ABSTRACT OF DISCUSSION

ON PAPERS OF ERS. GOLDSPOHN AND HOLDEN

DR. GEORGE R. WHITE, Savannah, Ga.: Our failures in these cases, whether they be of retroversion or prolapse—the two conditions are very closely associated—are because we do not take cognizance of natural methods. I disagree with Dr. Holden in placing the emphasis on the anatomic parts. It has been mentioned that the perineum supports the uterus; the uterus stays up as well when the perineum is cut right through. The uterosacral ligament is not much of a factor. The emphasis should be placed on the uteropubic ligaments, the so-called cardinal ligaments. The easiest way to do the operation is to make a small incision in the broad ligament, opening it up fully and putting in a retractor. Down under the coronary ligaments are the supports of the ligament, and there the deviations of the uterus may be straightened. The tissues here are strong and firm and will hold during pregnancy. Operation is done in different ways, by the Marcy operation, by the adnexal operation, etc. Both operations are good and either can be done if the ligaments have not broken loose by a difficult delivery and become contracted in the side of the pelvis. To get at them one must come down over the broad ligament and pull them out until reaching firm tissue; then use them where they belong. On that line I believe we shall make our advance in the treatment of retrodisplacement and prolapse.

DR. H. GRAD, New York: I was glad to hear Dr. Holden's paper because it deals with the failures. Dr. Holden referred to the papers on Retroversion of the Uterus, which were written for the New York Obstetrical Society, and I had the pleasure of looking up the operation for retroversion in one of our hospitals. I found that at the Woman's Hospital about 800 women had been operated on in five years. Only a small number of these could be traced. The studies of the cases that could be traced showed that no matter what method of operation was employed for the uncomplicated cases of retroversion, success was obtained in about the same proportion of cases. Anatomic results were obtained in a large number of cases. The symptomatic results in the Alexander operation were about the same as in the Gilliam operation, almost the same as in ventrosuspension. It seemed to make little difference what operation was done in the uncomplicated cases of retroversion. It makes no difference whether one plicates the round ligament or cuts the broad ligament and stitches it together, they all give about the same result. The trouble comes when complications enter, when the cervix has fallen down, when the cardinal ligaments which Dr. White spoke of have retracted and allowed the pelvic floor to sink. In these cases failures will follow. A large proportion are due to the fact that the anterior wall

of the vagina is short, as Dr. Holden pointed out. Here we must treat the complications. Dr. White said that the uterosacral ligaments did not give much support to the uterus. This may be true, but when one utilizes them in operations they give good results. About three years ago Dr. Jellet of Dublin published reports of twenty cases in which the uterosacral ligaments were used. Since that time we have been using the method of shortening the uterosacral ligaments in complicated cases in which the pelvic floor has been split and with excellent results. It is of first importance, therefore, to distinguish between lacerations of the perineum and of the pelvic floor, as laceration confined to the perineum is always a laceration in the median line. If superficial it will give rise to but few or no symptoms, but if deep enough it will separate the transversus perinei muscles which coalesce at this point with other muscular structures and by retraction of their torn ends will cause a gaping vulvar orifice. When, as is usual, both of these anatomic structures are involved, the laceration of the perineum being central and that of the pelvic floor lateral, it is of first importance to make the dissection not alone within the vagina to restore the pelvic floor, but likewise to carry it down low enough so that the retracted transversus perinei muscles can be included with the overlying fascia and sutured at the same time the pelvic floor is repaired.

DR. JOHN M. FISHER, Philadelphia: Dr. Goldspohn very properly calls attention to the fact that in order to appreciate the symptomatology and clinical significance, as well as the operative procedure adapted to the proper repair of the pelvic floor, it is of first importance to have a clear conception of the anatomy of the parts. Evidently he has not read the article on Diseases of the Vulva and Vagina in Keen's Surgery, volume 5, in which I described minutely the very thing to which he calls attention, the triangular ligament, or as I term it, the vaginal septum. In the study of vulvovaginal injuries we must take into consideration this triangular ligament in its relation to the muscular structures of the vulva. If this is not done, especially in operating on the pelvic floor alone when there has been laceration of the perineum in addition, we still have to deal with a gaping vulvar orifice.

DR. C. M. ECHOLS, Milwaukee: A word about the Reynold's operation which Dr. Holden has had occasion to do. I have been looking for indications during the last year to do this operation but very rarely have found a suitable patient, especially among multiparous women, who constitute the majority of patients on whom we have to operate. Most of these women I have to operate on have a little tendency to cystocele, and the Reynold's operation is contra-indicated in all such cases.

DR. JOHN A. MCGINN, Philadelphia: In the matter of the history of the operation referred to as the Reynolds operation, Dr. B. F. Baer of Philadelphia did this operation at the same time as Dr. Reynolds, and I feel that it really deserves to be termed the Reynolds-Baer operation.

DR. CHANNING W. BARRETT, Chicago: Dr. Goldspohn and I agree that the importance of this question lies in the fact that perineal work is in the developmental process instead of a finished condition. He laid stress on the inefficiency of many of the standard cardinal operations, and I agree with him thoroughly. Dr. Goldspohn did pioneer work some years ago, but he stopped by getting deep enough, and then, instead of isolating muscles and fascia—and he gives the reason for that—he left it at that point, closing by side to side sutures. I emphasize the point that this is mural work, dealing with the lower wall of the abdomen, and that it is hernioplasty. Several years ago, having a condition of this kind, I devised a procedure of making a longitudinal incision posteriorly and closing it transversely.

DR. BROOKE M. ANSPACH, Philadelphia: The attention which has been given in recent years in perineorrhaphy to the dissection and coaptation of the actual fibers of the levator ani muscle and the deep layers of the pelvic fascia, has undoubtedly improved the results of the operation. In all operations of this type, it is desirable to place some sutures in such a fashion that the anterior wall of the rectum is

drawn well up toward the cervix. Dr. Ward of New York has laid stress on this point. It is undesirable in these operations to remove any more than a minimum amount of the vaginal mucous membrane. If the vaginal mucosa is extensively removed in the denudation and dissection preceding the introduction of sutures, the redundancy of the vaginal wall which nature has provided in the vaginal sulci is lost, and a repetition of the laceration in subsequent childbirth is almost inevitable.

DR. ALBERT GOLDSPOHN, Chicago: I am convinced that many gentlemen who are not dealing with the levator ani in their operations think that they are. They are honest about it but they are mistaken. While Dr. Barrett may now be going deep enough to seize the levator, he has repeatedly mistaken the inner edges of the trigon and bulbocavernosus muscle as the levator ani muscle in his illustrations. Edward Martin says in his new Atlas, "*Haftapparat der Weiblichen Genitalien*" that this is a common clinical mistake. With regard to the remark of Dr. Fischer, concerning the article in Keen's Surgery, no proper conception at all is there given of the urogenital trigon—a three-ply structure—as constituting the most tangible, the middle stratum, of the female perineum. Waldyer's division of the female pelvic floor and perineum into three strata, makes the anatomy much clearer. What has been mistaken, by many operators for the levator ani, is the prominent vaginal edge of the fascial trigon (of the second stratum) reinforced by the bulbocavernosus muscle. These two together can be felt as a firmer structure than the levator ani ever is, at both sides of the vaginal entrance to the pelvis; but they lie more superficially, about in a plane extending between the pubic rami and only about 2 to 3 cm. from the skin border; while the levator lies within the pelvis, more laterally and at twice that depth.

In retroversion work we should choose methods that are anatomically correct. Any procedure that consists in doubling up the thick uterine end of the round ligament in the shortening process, and then depends on the terminal frayed-out useless peripheral end of the ligament to do any holding, is anatomically irrational; not only because the round ligament is so diminutive there, but also, it has no attachment or anchorage outside of the parietal peritoneum, except areolar tissue in its curved course to the inguinal canal. It will yield indefinitely to any pull that is sufficient to dislodge the parietal peritoneum. The Webster-Baldy and the Emil Ries' operations, therefore, I regard as inconsistent on anatomic grounds. Very much better are attempts to get at and to cross the sacro-uterine ligaments in front of the cervix, by way of the vagina. Retroversion is most efficiently dealt with by some transplantation of the round ligament into the abdominal wall, in some one of ten or more different ways. Even in cases in which perhaps it is not ideally the best thing theoretically, practically it is the best thing, because we make use of the thick end of the round ligament to do service; and because this type of operations has borne a good clinical test.

DR. FREDERICK C. HOLDEN, New York: My main object was to emphasize the importance of the proper selection of cases and of operations. Many men are doing one operation in all cases. They may not know that they get failures, but I think others find them. I would say to Dr. McGlenn that I did not mean to rob Philadelphia of any of the glory in the Wylie-Baer operation. I knew that Drs. Wylie and Baer were doing this work simultaneously, but I believe Dr. Wylie was the first to report his results. We do not do the Reynolds operation in the presence of cystocele.

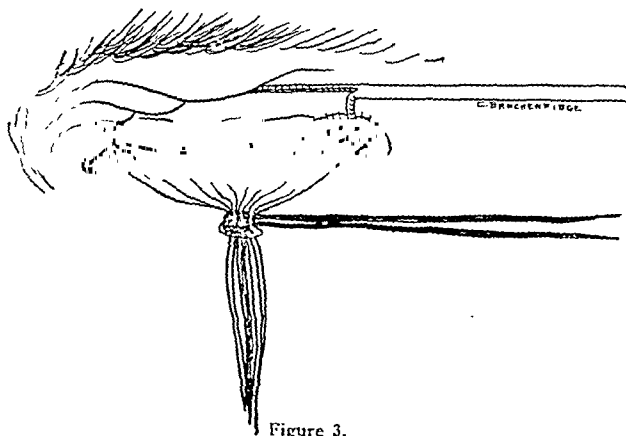
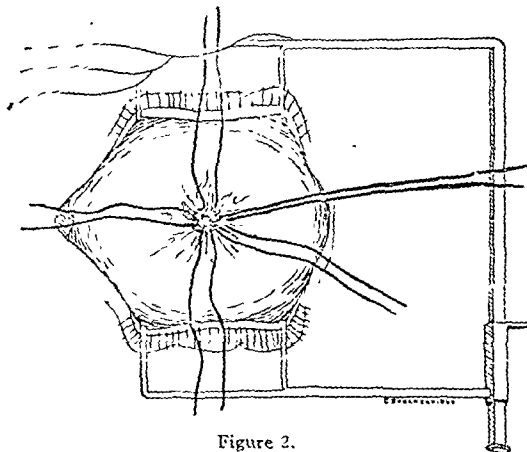
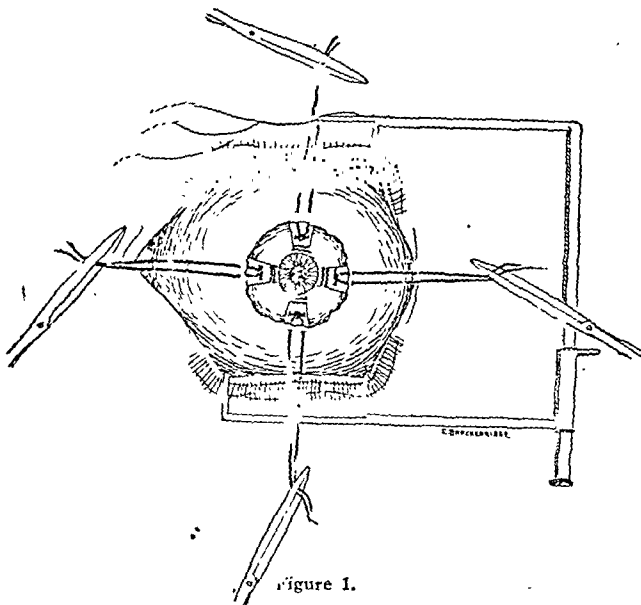
Physical Examinations and Efficiency.—We are already beginning correctly to evaluate the importance of periodic physical examinations in maintaining a continuous state of physical efficiency. Whenever these have been carried into effect, they have resulted in the detection of numerous defects, or diseases, in their incipency, and made it possible to apply suitable remedies before irretrievable damage has been done.—J. W. Schereschewsky, *Public Health Rep.*

ENUCLEATION WITH TRANSPLANTATION OF FAT INTO THE ORBIT *

EDWARD STIEREN, M.D.

PITTSBURGH

The loss of an eye is to any one a dire calamity, but to the laborer or artisan it has its economic side as



well, since employers are usually adverse to giving employment to a man who possesses but one eye.

* Read before the Section on Ophthalmology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

It becomes our duty therefore when called on to remove an eye to provide for a cosmetic after-result that will simulate as nearly as possible a normal appearance, and to strive not only for mobility of the artificial eye but to provide as well a sufficient cushion



Figure 4.

or stump for it to rest on and thus do away with the tell-tale depression of the upper lid, so conspicuous in simple enucleations.

For the past two years and a half I have transplanted fat into the orbit in all of my cases of enucleation, sixty-six in all.

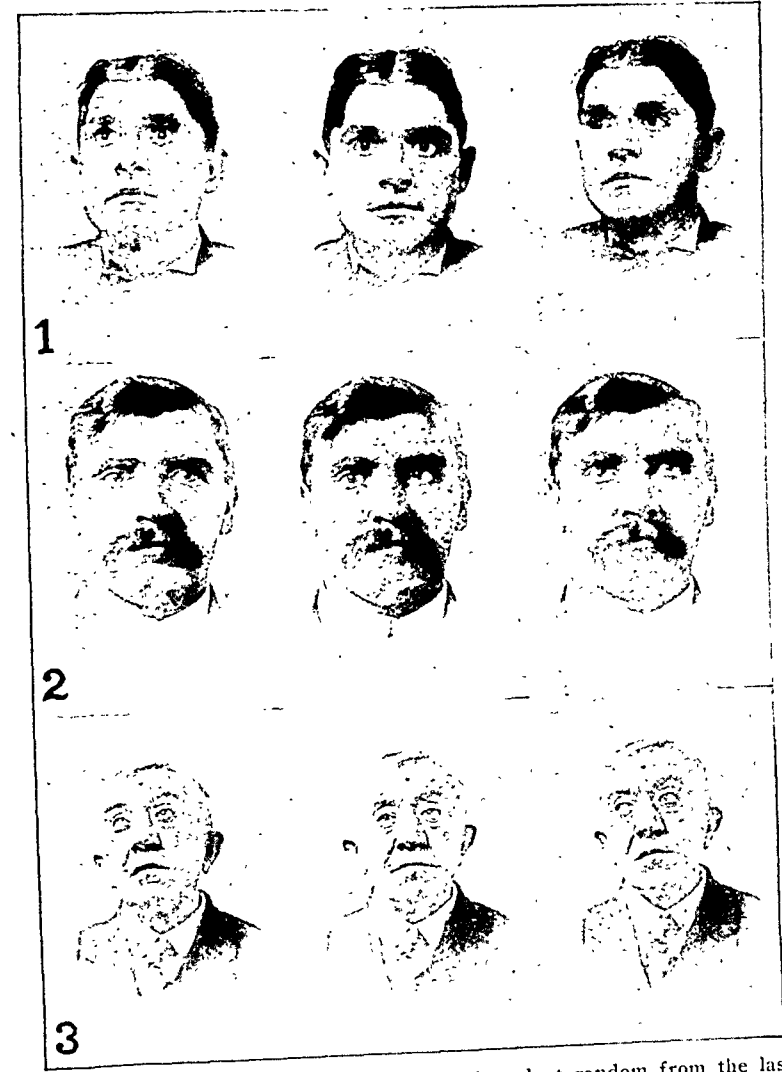


Fig. 5.—In this and Figure 6, cases selected at random from the last twenty-six illustrate the adaptability of the operation to all conditions requiring enucleation. 1. Left eye, exudative iridocyclitis with increased tension; eye blind and painful. 2. Right eye, phthisis bulbi following penetrating injury through cornea and ciliary region. 3. Left eye, absolute glaucoma.

In the last twenty-six cases I have departed from the usual technic as originally proposed by Barraquer, since with it I noticed too frequently a shrinkage of

the cushion from absorption of the fat. I reasoned that the old technic which required the fat to be enclosed within Tenon's capsule provided for entirely too little fat, and also that the fat was not favorably placed to secure the best nourishment. The success with the improved technic, which calls for a much larger piece of fat and direct union of the fat to the conjunctiva, has been most gratifying.

I divide the conjunctiva close to the limbus; dissecting it and Tenon's capsule back as far as possible. A strabismus hook is then introduced under the superior rectus, which is held by an assistant while a double-armed No. 00 twenty-day chromic catgut suture is passed through the muscle from below upward close to its lateral margins behind the hook and loosely tied on top. The suture is then passed through the con-



Fig. 6.—4. Left eye, melanosis of choroid. 5. Right eye, incised wound through upper lid, cornea and sclera; lid sutured and eye enucleated with transplantation of fat at the same time; mobility good, but upper lid thickened and stiff from scar. 6. Right eye, large opaque staphyloma of cornea.

conjunctiva about 2 mm. from its edge directly over the muscle; it is not tied at this time, but only disarmed and the ends held in a pair of hemostats. The internal, inferior and external recti muscles with their overlying conjunctiva are similarly treated (Fig. 1). The eyeball is then forced out of the socket by pressing the speculum backward, drawn toward the nose, and the optic nerve severed. The oblique muscles and any adherent tissues are severed and the socket turned over to an assistant, who, making gentle traction on the four catgut sutures and retracting the conjunctiva and muscles, checks the hemorrhage by packing the cavity with hot moist boric acid cotton compresses.

The abdomen, which has been prepared previously, is now bared and a vertical incision is made in the median line beginning just below the umbilicus and carried downward about 2 inches, cutting through to the aponeurosis of the rectus abdominalis. At the bottom of this incision a similar one is made at right angles and a flap dissected which contains the full thickness of the abdominal fat. A piece of fat which should include the subcutaneous tissue and which should be *about the size of the enucleated eye* is then excised. The abdominal wound is turned over to a second assistant who checks hemorrhage and sutures the integument. The excised mass of fat is then introduced into the orbit (hemorrhage from which is usually checked by this time) *with the subcutaneous tissue upward*, so as to provide for union between it and the edges of the severed ocular muscles and conjunctiva. The catgut sutures are then tied together, traction is made on them and a purse-string suture of No. 0 twenty-day chromic catgut is passed through the conjunctiva and firmly tied (Figs. 2 and 3). Figure 4 shows the appearance of the stump three weeks later, after absorption of the sutures. I allow wearing of the prosthesis as soon as this occurs.

There is no reaction following the operation; the lids do not become swollen or ecchymosed, the only precaution which I insist on being to fill the eye with my modification of White's ointment¹ after the operation and daily thereafter for a week. The time required in the operation is usually about thirty minutes.

There will result a certain amount of absorption of the fat, varying from a third to a quarter of its bulk; but this usually ceases within six weeks after the operation, leaving a soft, mobile cushion on which the ordinary Snellen eye rests comfortably and moves with the sound eye.

Westinghouse Building.

ABSTRACT OF DISCUSSION

DR. JOHN A. DONOVAN, Butte: Some years ago the British Ophthalmological Society appointed a committee to investigate and report on enucleation operations. If my memory is correct, they spent three years careful study and at the end of that time reported in favor of complete enucleation of the eyeball, stitching the tendons together and using the Snellen reform eye. Though I have in season and out of season, preached against so many enucleations yet we have not yet reached the place at which it has become an obsolete operation, so we consider first the safest method, then that giving best cosmetic results. I must admit I have, as a rule, been very well satisfied with the operation as approved by the British Society. Stieren's operation when it is properly performed as far as the eye is concerned appears to be perfectly safe and probably does correct considerable of the cosmetic results of enucleation; this undoubtedly has good features. Though it, in my opinion, entails an extra operation on the abdomen—this though slight, adds a slightly greater risk—this replaced

tissue also must conform to all the requirements of surgical perfection thus entailing again some risk within the orbital cavity. All of which I do not feel, considering the very good results obtained otherwise, to be at all times justifiable. Of course, in infected cases, as most cases are, I presume Dr. Stieren himself does not recommend it. In the operation I prefer to fix each tendon in a curved advancement forceps, cut it and leave it in the forceps till all are cut, then, after removing the globe, stitch these tendons and conjunctiva together by through-and-through suture. This method saves considerable time over that of inserting the stitch in each when reached. I put in a Snellen eye about the fifth day and change its size in a few weeks. I consider the early and constant wearing of a full-sized eye one of the essentials to a neat, successful termination.

DR. JOHN GREEN, JR., St. Louis: An implantation operation has a primary and a secondary object: first, to form a prominent and mobile stump, which shall impart some of its mobility to the prosthesis; second, to produce a socket which shall be shaped to promote and not hinder the drainage of tears and mucus. A mild degree of conjunctival irritation due to contact between the glass eye and mucosa is the rule. After simple enucleation the secretion almost invariably finds its way behind the prosthesis and sinks to the bottom of the socket, there to form a medium for the cultivation of micro-organisms. The Frost-Lang operation, namely, the implantation of a hard sphere of glass, platinum or gold into Tenon's capsule, seems best to meet the indications. Fox, and more recently Sweet and Greenwood, have warmly endorsed this procedure. The latter's experience has led him to adopt a larger sphere than hitherto used. With the sutures disposed in three layers a purse string around Tenon's capsule, muscle sutures, and continuous conjunctival stitches—there is hardly any danger of extrusion. The appearance of the patient after this operation is all that could be desired. Mobility is excellent, there is no depression of the upper lid, and drainage of secretions toward the lid margin is promoted. Some may be deterred from performing this operation by the fear of sympathetic ophthalmia, but, as has been shown by both Sweet and Greenwood, this fear is groundless. Dr. Stieren believes that after a little primary shrinking the implanted fatty mass retains its volume indefinitely. Is such an assumption justifiable? Is it not a fact that after simple enucleation the orbital fat slowly becomes less in volume, the process of shrinkage covering several years, and that which appears after, say, two years, to be a fair result, is shown after five or more years to be a deep cavity into which we place an artificial eye that deceives no one as to its artificiality. Dr. Stieren's oldest cases date back only two and a half years. What will be the appearance of the socket in, say, two and a half years more? Let us not forget too that with advancing years much of the body fat disappears. Is it reasonable to suppose that the implanted fat will be exempt from this process? When cosmetic considerations are of prime importance, I believe the Frost-Lang operation as modified by Greenwood is the operation of choice.

DR. W. E. LAMBERT, New York: I have had a limited experience with this operation, and the immediate result has been satisfactory. I have not been able, however, to follow them up. My impression is that it is not permanent. Has Dr. Stieren followed up his cases, and what is the permanent result? What is his experience with secondary implantation, putting the fat in two, three, or four months after the enucleation? That is being practiced by some and they make great claims for it. I am doubtful as to its being an efficient or a wise operation.

DR. EDWARD B. HECKEL, Pittsburgh, Pa.: I have done a number of fat implantations or transplantations and have come to the conclusion that it is a case of "love's labor lost." I think if we will stop to consider the mechanics of the movements of the artificial eye, our ideas will change as to trying to produce an artificial stump to take the place of the enucleated eyeball. In the case of an eyeball the movements are brought about by a pull, in the artificial eye it is a matter of a shove. The artificial eye moves because the tissues on one side are withdrawn and the tissues on the other side are shoved so that when the artificial eye moves out it does so because it is shoved out, and down because it is shoved down,

1. As I stated in an article on "The Treatment of Ulcer of the Cornea," (Pennsylvania Med. Jour., June, 1907), I have modified and I believe improved the formula originally suggested by Dr. White of Richmond by adding a small amount of lanolin in which to dissolve and work up the mercuric chlorid and sodium chlorid, as follows:

Hydrargyri chloridi corrosivi	gr. i
Sodii chloridi	gr. v
Adeps lanae hydrosoi	q.s.
Petrolati	3 vi

The sodium chlorid and mercuric chlorid are dissolved and rubbed up in about 1 dram of lanolin; the petrolatum is boiled for five minutes, the impregnated lanolin added and, after boiling for five minutes longer, the liquid ointment is poured into jars. After it has cooled it will be found to be of a proper consistency to introduce under the lids, becoming slowly melted by the heat of the body and permeating to all parts of the conjunctival sac.

etc. To get the greatest mechanical advantage for these movements the muscles should be spread apart and not bound together about a small ball of fat or what not. I much prefer to do a simple enucleation without any sutures. After the eyeball has been removed and the bleeding stopped, I allow the lids to collapse and place over them a small roll of sterile gauze about as large as my little finger and cover all with a tight bandage, which is permitted to remain in place for seventy-two hours or even longer. By this method the recti muscles are forced apart and find attachment in the stump where the mechanical advantages for the movements of the artificial eye are greatest. My results for motility of the artificial eye are excellent.

DR. EDWARD STIEREN, Pittsburgh: I am opposed to all implantation operations; I mean the introduction of any foreign substance, as a glass ball. I believe it is surgically incorrect. I make a distinction between implantation and transplantation, as of autogenous fat. With regard to Dr. Green's question, whether the results are permanent, my experience extends over three years now. The case of staphyloma illustrated by Figure 6 was done over two years ago. The picture was taken just before the paper was sent in last March. The mass of fat is still as good. There will be a certain amount of shrinking, probably one-third. Time will tell whether this is a satisfactory operation with permanent results. I am so pleased with it that I shall go on with it. I have had no experience with late transplantation. At the last meeting of the American Ophthalmological Society, Dr. A. N. Alling, who reported two cases in 1910, said to me that he thought the mobility would be as great if the four recti muscles were not sutured together. I tried it since then in one case and the result was disappointing. While the cushion is satisfactory, still the mobility of the eye is poor. I find that to fix the implanted fat thoroughly to the conjunctiva helps to nourish the fat.

REPORT OF A CASE SIMULATING ELEPHANTIASIS*

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History.—M. D., colored woman, aged 29, single, factory-hand, came under my observation at my clinic at the Richmond City Jail Hospital in February, 1913. Her father had died of prostatic enlargement; her mother was living and in good health, aged 45; one brother and one sister had died in infancy. The patient had had the diseases of childhood, and with the exception of an attack of malaria at 16 years of age, had never otherwise been sick. Menstruation began when she was 12 years of age, and was regular and normal in amount until the patient was 21, when it became irregular, appearing frequently twice a month and lasting as long as seven days. For the past year it had been scanty, lasting only three days, and accompanied with a great deal of pain which was usually worse on the last day, at which time she would expel a clot. The patient uses alcohol, drinks tea and coffee, uses tobacco, and probably is a prostitute, though she denies the history of any venereal disease.

Present Illness.—About three months prior to this time, February, 1913, the patient noticed a swelling of each labium which was not painful, but itched continually. The right labium began to swell about one week before the left, and then both increased in size very rapidly for two months, after which time there was little change noted. Coincident with the time that their growth checked, there appeared on the right labium, or anterior growth, an ulcerated area, accompanied by a profuse lymphorrhea. The left, or posterior growth, was painful at times, and the patient suffered with a pain in her back and an uneasy feeling in the tumors.

Physical Findings.—Pendulous growths were noted from each labium which hung almost to the knees when the patient

was standing, the one from the right labium hanging in front and the one from the left, behind. The posterior growth was not quite so large as the anterior, but more irregular in outline, and did not hang quite so low. It showed several large ulcerated areas, apparently the result of friction in walking, from which lymph continually exuded.

Owing to the location of the growths, a vaginal examination was not possible. There was no abnormality noted in any organ of the body. The patient, however, had lost about 20 pounds in weight since the appearance of the growths in December, 1912.

Examination of the urine was also omitted because it was impossible to secure a satisfactory specimen.

Blood examination revealed: white cells, 7,200; red cells, 3,400,000; differential count: polymorphonuclear neutrophils, 63.5; lymphocytosis, 17.3; large mononuclears, 15.4; eosinophils, 3.2; basophils, 0.6. The *Filaria sanguinis hominis* was not found. The Wassermann test was positive.

The specimen of tissue from the growths consisted of fibrous connective tissue showing an extreme condition of edema. There were small perivascular collections of round cells around the blood- and lymph-vessels.



View of growth from the rear, patient stooping.

Diagnosis.—When the case was first brought to my attention I felt confident that it was one of elephantiasis, and it might be well to review briefly this condition. Of course, it is a disease of the tropics, although sporadic cases are seen in the southern portion of the United States. Dr. Kelly reports quite a few well-defined cases. It is caused by the animal parasite, *Filaria sanguinis hominis*, of which there are two varieties, the *Filaria sanguinis hominis diurna* and the *Filaria sanguinis hominis nocturna*. The diurnal variety is found in the superficial vessels only during the waking hours, and the nocturnal is found only when the patient is asleep. It was a source of confusion to know how this curious phenomenon could be explained, and the puzzle was finally solved when a man who had the nocturnal variety was accidentally killed in the daytime, and the blood from his deeper vessels was examined, and was found to be swarming with filariae where they had gone in hiding until the

* Read before the Richmond Academy of Medicine and Surgery.

patient slept, when they would migrate to the superficial vessels where they were easily found.

In this condition the lymph-vessels are greatly dilated because of the blocking or choking of these channels, forming a varix, usually around the base or pedicle, together with large blood-spaces or sinuses, affording an excess amount of pabulum to the structures supplied, which accounts for the rapid growth of connective tissue. Accompanying this lymphedema, wherever there is a break in the continuity of the surface, there is usually a profuse lymphorrhea.

There is a condition caused by syphilis known as syphilis infiltrous in which the pathologic findings are identical with the foregoing, but in which the filaria is absent, and after numerous consultations I concluded this to be the correct diagnosis in this case.

Treatment.—Having arrived at this diagnosis, I determined to remove these growths and this was done by making an incision through the skin on the outer side of each growth the shape of the letter Y inverted so that the flap to be left had the appearance of an inverted V. This was done to allow for the retraction incident to the weight. Large venous blood-spaces were encountered with every stroke of the knife. They were easily controlled with clamps and many did not require ligatures. Care was taken not to injure the vaginal pouch, which I found pulled down and almost obliterated, but which retracted to a certain extent as soon as the growths were removed. A very satisfactory approximation of the skin-flaps was secured, rubber drainage-tubes were left *in situ*, and the usual dressings applied. In order that we might watch the immediate result of the operation, salvarsan was not given for one week, at the end of which time there was a general lymphedema and a profuse lymphorrhea with every indication of a rapid return of the condition. One week after the administration of salvarsan a marked improvement was noted, and in three weeks after the operation, a second dose was given. This was followed by a prompt disappearance of the edema, and the patient was soon able to be about her duties. The combined weight of the growths was 12 pounds. The patient passed from my observation in May when she left the city jail to serve a sentence in the state penitentiary.

Recently I was given an opportunity to secure a photograph which shows the patient to be in a very satisfactory condition. The labia are absent and only a small portion of the clitoris is left. The vagina is normal, and the patient has no leukorrhea or discomfort of any kind. Her general condition is excellent.

701 Grace Street West.

Traumatic Neuroses.—A. Ciampolini, the medical inspector for the state railroad system of Italy, has recently published in *Ramazzini*, 1914, viii, 1-108, an analytic study of 160 out of a total of 200 cases of neurosis following railroad accidents. The majority were commercial travelers and postal clerks; they seem to acquire what might be called a professional dread of accidents, and this is an important factor in the neurosis. The susceptibility to suggestion is extreme and a physician's incautious remark may start or aggravate the neurosis. The jar of the trains does not seem to predispose the trainmen to nervous trouble, as these formed only 12 per cent. of the total. Only 0.465 per thousand developed neuroses among 25,793 employees who met accidents of various kinds in 1909; and the proportion has been the same since. Ciampolini states that after the question of indemnity had been settled the neurosis gradually subsided with final complete recovery.

INFECTION OF NASAL CAVITY FROM DISEASED TOOTH-ROOT

SPECIMEN SHOWING PATHWAY OF INFECTION THROUGH THE MAXILLARY SINUS*

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The possibility of the passage of an infection upward from a decayed tooth-root through the maxillary sinus to the nasal cavity is a matter of common medical knowledge. The rhinologist frequently finds in this sequence of events a long-delayed explanation, especially of trifacial neuralgias as well as various nose and throat conditions.

The accompanying illustrations are from a post-mortem specimen in which the pathway of such an infection is strikingly marked out by pathologic changes, namely, a necrotic area around the root of a first (or

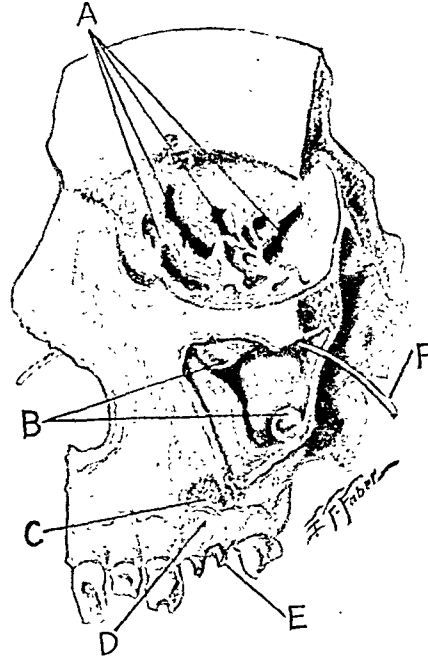


Fig. 1.—Specimen showing: A, ethmoidal sinuses opened from orbital aspect and found to be free from any evidence of disease; B, polypi (upper one located at the lip of the ostium); C, area of necrosis around tooth-root; D, fistula from tooth-root opening on the gum; E, diseased first bicuspid; F, bristle passed from the maxillary sinus into the nose through the normal ostium.

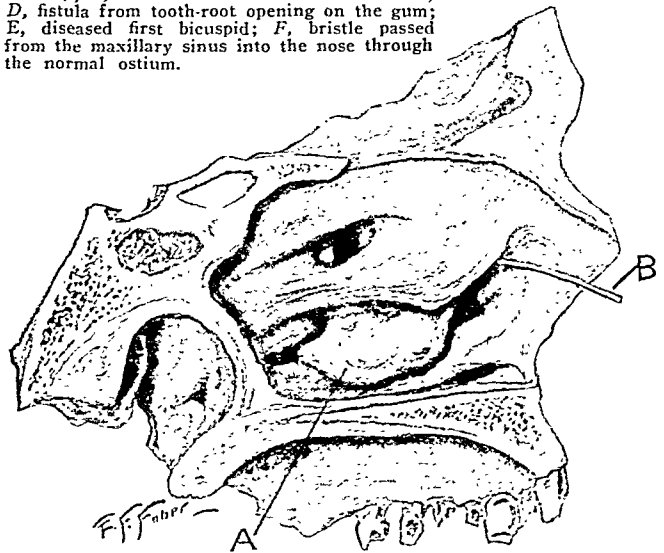


Fig. 2.—Specimen showing: A, polyp in middle fossa of the nose growing from the lip of the unciform groove; B, bristle passing through the maxillary ostium beneath the middle turbinate.

second) bicuspid tooth, a fistula from this area opening on the gum, changes in the mucous membrane of the maxillary sinus adjoining this area and with polyp formation especially around the ostium, both on the maxillary sinus side and in the nasal cavity.

* Exhibited before the Section on Oto-Laryngology of the Philadelphia College of Physicians, and the Philadelphia Pathological Society.

The ethmoidal sinuses, opened from the orbital aspect, are seen to be uninvolved.

A point of interest in Figure 2, which, however, has no relation to the foregoing, is this: The sphenoid sinus in this case is represented by a very small depression on the back wall of the nasal cavity (hidden in the illustration) while the space below the sella turcica, usually occupied by the sphenoid sinus, consists of a thick mass of cancellated bone. The cavity shown in this region is not the sphenoid sinus, but was made artificially with the curet in searching for it. It is comforting to the surgeon working in this region to know that when the sphenoidal sinus is absent its territory is usually occupied, as shown in Figure 2, by a thick mass of bone.

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CEREBROSPINAL EXAMINATIONS IN "CURED" SYPHILIS

CASES IN WHICH THE BIOLOGIC METHOD AS A CONTROL
HAS BEEN USED *

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Since the application of the Wassermann reaction to the blood-serum as a biologic control in the treatment of syphilis, we have rested securely in the thought that this method of management, if applied correctly, was the last word in the prognosis of this disease. All authorities have recommended it as the most dependable aid which we have in the control of our treated cases of syphilis, and truly it is; but as discovery after discovery has followed in quick succession, each marking an epoch in our knowledge of syphilis, it is but natural that our opinions should change.

Noguchi's¹ demonstration of the *Spirochaeta pallida* in the brains of paretics has opened up a new phase of the infection, and whereas we before thought that this localization was only the end-result of the infection, we now know differently. That the spirochetes involve the central nervous system early, in a large percentage of cases, was little dreamed of three years ago, and only within the last year and a half has the management of this class of infections been given serious thought by the average syphilographer.

Since the application of lumbar puncture with spinal fluid examinations, many cases showing a negative blood-serum Wassermann for from eighteen months to two years without treatment show subarachnoid involvement. In the light of our present knowledge, lumbar puncture with spinal fluid examinations is demanded in all cases of syphilis, no matter at what stage of the disease, as a control on future complications of the nervous system.

An apology is offered for referring to the diagnosis of syphilis at the time of the presence of the primary lesion, as every syphilographer knows exactly the value of an early diagnosis, especially before the Wassermann is positive; but ever since the arrival of the easy water-soluble neosalvarsan, the treatment of this dis-

ease has passed out of the hands of the specialist into the hands of everybody with a medical degree. It is safe to prophesy that our insane hospitals in the future will contain a larger percentage of cases with involvement of the central nervous system than they do to-day. Too little heed is paid to this golden opportunity, and too great a dependency is placed on a few ill-timed "shots" with no consideration whatever of the subarachnoid space.

Since October, 1913, I have performed lumbar puncture with spinal fluid examinations on as many patients "biologically cured" as I could induce to return for examination. Of these so-called "cured cases," excluding syphilis with cerebrospinal manifestations, I have found spinal fluid involvement in 18.3 per cent. Many patients resting securely in the faith of a persisting negative Wassermann and good health refused to permit this procedure.

DISCUSSION OF THE TABLE

The accompanying table shows 6 cases of primary syphilis, 18 of secondary syphilis, 4 of tertiary syphilis, 14 of latent syphilis, 1 of congenital syphilis, and 6 of syphilis with cerebrospinal manifestations; of the last 6 cases, 2 are of incipient tabes, 1 of tabes, 2 of cerebrospinal syphilis and 1 of complete optic atrophy.

The original object of this investigation was to ascertain whether or not the "cure" had been complete, and if not, the reason.

Mott² long ago called attention to two factors which play a rôle in the involvement of the nervous system: (a) the specific form of spirochete, and (b) poor resistance on the part of the host. Having studied these cases with this idea in mind, I have deduced the conclusions which are given below.

PRIMARY SYPHILIS

All the cases herein recorded went to a satisfactory termination, and I believe are permanently cured. The largest quantity of salvarsan given to a single patient, together with rubbings, was 4.2 gm.; the smallest was 2.4 gm.

SECONDARY SYPHILIS

In Case 8 the patient, D. H. D., of average nutrition, had been infected nine years, and spirochetes were demonstrated in the mouth lesions before treatment was begun. On account of the length of infection before treatment, the patient being a confirmed alcoholic, subarachnoid involvement might be suspected. Examination was negative.

In Case 9 the patient, H. R. A., aged 38, was strong and robust, and spirochetes were present after five years. Jan. 27, 1914, spinal fluid examination was positive. After intensive intravenous salvarsan, spinal fluid examination April 29, 1914, showed Wassermann negative, cells 3 per cubic millimeter, Nonne negative. The total quantity of salvarsan given was 4.5 gm.

Patient 10, G. K. L., aged 51, was very well preserved. There was cerebrospinal involvement at eighteen months. This patient has had fourteen injections of salvarsan intravenously, being a total of 7 gm., together with rubbings by a professional, and four injections intraspinally, one after the Swift and Ellis³ technic, 20 c.c. of serum being given, and three after the method of Ravaut,⁴ 4 mg. being given at each injection. The spinal fluid is still involved.

Patient 11, C. G., aged 28, strong and vigorous, came under observation during the secondary period. The blood Wassermann always vacillated; spinal fluid examination, December, 1913, was positive, Nonne positive, and lymphocytes 25 per cubic millimeter. Since severe persistent intra-

* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Noguchi, Hideyo: The Transmission of *Treponema Pallidum* from the Brains of Paretics to the Rabbit, THE JOURNAL A. M. A., July 12, 1913, p. 85.

2. Mott: In Power and Murphy's System of Syphilis, Oxford Press, 1908, ii, iv.

3. Swift and Ellis: New York Med. Jour., 1912, xcvi, 53.

4. Ravaut: Ann. de méd., 1914, i, 49.

venous medication, spinal fluid examination, March 24, 1914, revealed Wassermann negative, Nonne positive, and lymphocytes 3 per centimeter. Total quantity of salvarsan injected was 8.55 gm.

Patient 13, E. G. M., aged 24, was in good physical condition after two years' treatment, including five injections of salvarsan and mercury rubbings, the latter by a professional rubber, and showed a positive Wassermann on the spinal fluid. Later this patient received five intravenous injections at intervals of a week, making a total 5 gm. salvarsan. Second spinal puncture was refused.

In cases 14 and 15 (man and wife), each was treated differently; both show negative spinal fluid examination.

Patient 19, E. M. M., aged 28, robust and vigorous, had severe ulceration in larynx after four years. Spinal fluid examination is negative; blood Wassermann is still positive.

Case 23, F. E., is a reinfect case of syphilis, treated in 1911 for first infection, plaques and secondaries and positive blood Wassermann at this time. Patient since had negative blood Wassermanns Feb. 8, 1912, Feb. 4, 1913, Dec. 30, 1913. Second infection, exposed Feb. 15, 1914, secondaries with sore throat, May 22. Wassermann on blood-serum, positive. Spinal fluid examination negative.

was 13 years of age. At this time he had large gummas over both shins. Spinal fluid examination was negative.

SYPHILITICS WITH CEREBROSPINAL MANIFESTATIONS

Case 47 (N. DeH.) has a negative Wassermann; there have been two slight attacks of paralysis. The patient shows marked involvement of spinal fluid, and has been treated by the Swift and Ellis technic and Ravaut method.

Patient 49 (Mrs. E. S.), whose husband died of paresis, has occasional headaches, but is otherwise well. Wassermann is negative; there is enormous spinal fluid involvement. The patient has been treated with the Swift and Ellis technic and the Ravaut method.

Since beginning lumbar puncture with spinal fluid examinations I have made over 100 examinations.

Among some other cases that I have examined, three cases of secondary infection show involvement of the subarachnoid space; in three cases of latent infection with scarcely any treatment at all, spinal fluid examination is negative.

Considering the relation between the positive and



Fig. 1.—Dropping-glass, having the advantage of keeping the salvarsan excluded from the air at all times.

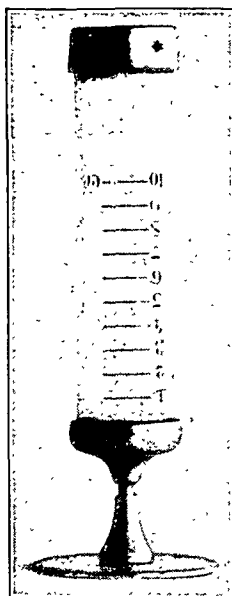


Fig. 2. — Converted syringe receptacle.

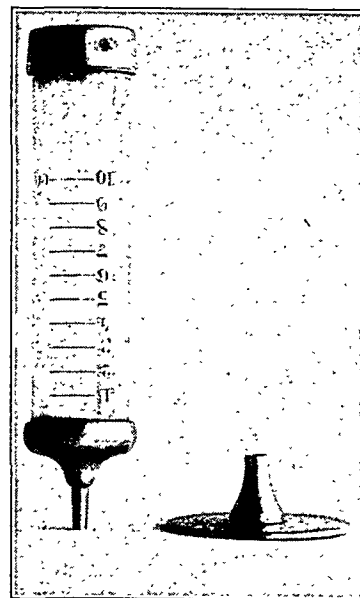


Fig. 3.—Record syringe with cap attachment.

TERTIARY SYPHILIS

Case 26, M. H. O., average weight 105 pounds, is the only patient in this series who showed involvement, and she is the wife of H. O., Case 36 under latent syphilis. Both show positive Wassermann on the spinal fluid.

Case 27 (M. D. H.) strong and vigorous, with a gumma on neck, was infected sixteen years before any treatment was begun. Spinal fluid is negative. One would suspect positive here.

LATENT SYPHILIS

Cases 30, 31, 37 and 38 are all cases of neglected treatment, in which one would suspect positive spinal fluid tests. All are negative.

Case 40 (F. O. B.) after provocative salvarsan shows positive blood and spinal fluid Wassermann.

Case 41 (Mrs. E. A., wife of E. A.) shows marked involvement of spinal fluid. I was unable to obtain husband's spinal fluid, at this time, but he is extremely irritable and spinal fluid involvement is possible.

CONGENITAL SYPHILIS

One would certainly suspect infection in Case 43 (H. H.), as treatment was not begun systematically until the patient

negative spinal fluid examinations in the marital infections alone, one would be strongly suspicious of a specific spirochete. That poor resistance on the part of the host plays a rôle in all infections is an absolute certainty, but who is going to point out the "weak"? I am sure I am not able to in my little experience.

That all infections with the *Spirochaeta pallida* are not potentially in the subarachnoid space should be readily conceded. Flexner⁵ has compared infections of this space with those of anterior poliomyelitis and those of pneumococcic origin. He shows clearly the futility of systemic medication in the latter infections. While the same holds true, in a measure, with syphilis, we are dealing with an infection that is slower in its progress, and as a consequence, our method of attack need not be so heroic at first. It is a mistake to begin injecting, intraspinally at the onset, every case of early syphilis in which there is spinal fluid involvement without symptoms.

5. Flexner, Simon: The Local Specific Therapy of Infections, THE JOURNAL A. M. A., Nov. 22, 1913, p. 1873.

The recent experiments with vital stains,⁶ trypan red and blue, show that it is possible to find these substances in the subarachnoid space after intravenous medication, as well as intraspinal injections, only in the latter it is more diffused and intense. For this reason I have preferred to adopt at first an intensive intravenous form of treatment, when no particular clinical manifestations are demonstrated, withholding intraspinal injections for the more severe and stubborn cases.

TREATMENT

The two methods of treatment available are intensive intravenous injections and intraspinal medication. In intensive intravenous injections, the plan which I have adopted is to give, in the early cases, as suggested by Collins,⁷ from five to seven doses of 0.5 to 0.4 gm. weekly, and then to rest three or four weeks, at the end of which time a puncture is made. If this shows a negative reaction, the treatment is resumed every other week for the same period of time, later once a month for three months, and still later, every other month. If a negative spinal reaction is maintained for a year, all treatment is suspended, but spinal examinations are recommended every six months. That this method is efficient is shown by examination of the blood-serum for salvarsan. Frequently it has been demonstrated in the blood-serum by the Abelin⁸ test ten days after the last injection.

While the time is relatively short to draw definite conclusions in regard to the merit of injections of salvarsanized serum, in intraspinal medication, most physicians who are familiar with the method realize the great value that comes from this form of treatment.

In another paper read before the Illinois Medical Society at Decatur in May of this year, my experience in the treatment of tabes on the service of Dr. Julius Grinker at the Cook County Hospital is given. The technic is the same as that used by Swift and Ellis, only the quantity used was from 15 to 20 c.c. undiluted with saline solution. Often pooled homologous serums were used.

Realizing the necessity of obtaining an equally efficient, as well as more rapid and simple means of medication, I have adopted the method of Ravaut as recommended by Wile,⁹ for direct intraspinal injections of neosalvarsan.

I dissolve 0.15 grm. of neosalvarsan in 5 c.c. of water (a hypertonic solution) in the dropping-glass (Fig. 1). This has the advantage of having a glass stopper and lessens the exposure to air.

A spinal puncture is made and the fluid is collected into the converted syringe receptacle (Figs. 2 and 3) up to 5 c.c.; the mandrin is reinserted to stop the flow, the desired dose is dropped into the syringe, the piston is placed in position, the syringe is inverted, fluid shaken up, the mandrin is withdrawn, connection made and the fluid reinjected. In following out the method, I have followed the practice of giving salvarsan every fourteen days intravenously, to take care of any possible systemic infection that might be present.

6. Tilney, F.: Long Island Med. Jour., 1914, viii, 121. Schnaudigel, O.: Arch. f. Ophth. (von Graefe's), 1913, lxxxvi, 93.

7. Collins, Joseph: Syphilis and the Nervous System, THE JOURNAL A. M. A., Sept. 13, 1913, p. 81.

8. Abelin: München. med. W. hnschr., 1912, lix, 81.
9. Wile, Udo J.: The Techn. of the Intradural Injections of Neosalvarsan in Syphilis of the Nervous System, THE JOURNAL A. M. A., April 11, 1914, p. 1165.

CONCLUSIONS

1. Too little attention is still paid to the diagnosis of syphilis at the time of the presence of the primary lesion.
2. A great majority of physicians fail to realize the golden opportunity that an early diagnosis presents.
3. Control of the treatment by the biologic examination of the blood-serum must be supplemented by spinal fluid examinations.
4. Intensive intravenous injections should always be tried first, in early cases, before intraspinal injections are resorted to.
5. Based on clinical observation, there is a strong possibility of a specific spirochete for the nervous system.

ADDENDUM

Since making the foregoing report at the session of the American Medical Association at Atlantic City in June, four out of seven cases under treatment show the following: One case with cerebrospinal fluid involvement, without symptoms, after 2 mg. of neosalvarsan injected according to the Ravaut technic as described above, showed bladder paralysis which still persists after six weeks; one case of tabes shows marked incoordination with marked numbness and anesthesia of the lower extremities; another patient with tabes is unable to walk at all; numbness and anesthesia are markedly increased; a fourth case shows the same symptoms, but, under strychnin, 1/60 grain three times a day, the patient has improved somewhat.

In the last three cases, the dose given was always 0.004 mg. and no symptoms appeared until after the third injection, the injections being made at intervals of two weeks.

In view of this later experience, which is somewhat comparative, I believe that the Swift and Ellis technic is superior and should be adhered to. If the Ravaut method is to be used at all, the dose should be extremely small and should be dissolved in at least 15 c.c. of spinal fluid.

32 North State Street.

THE TREATMENT OF SYPHILIS OF THE NERVOUS SYSTEM*

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While it was recognized soon after syphilis became pandemic that the nervous system played a part in the morbid process, it appears that Knorre was the first, in 1849, to call attention to the fact that paralysis might occur in constitutional syphilis soon after or synchronously with the earliest symptoms. He cited five cases in three of which paralysis occurred three months after infection. Since then numerous publications by neurologists and syphilologists have appeared giving clinical evidence of the early involvement of the nervous system. Nonne⁴ has observed cerebral syphilis developing four months after infection and

* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

On account of lack of space this paper has been abbreviated for THE JOURNAL. It will appear in full in the Transactions of the Sections and in the author's reprints.

4. Nonne: Syphilis and the Nervous System, translated by Ball, 1913.

mentions a case occurring simultaneously with the roseola. Leudt reported brain lues in two old persons three months after the appearance of the initial lesion. Mott⁵ has observed meningitis even before the primary sore was healed, and he is sponsor for the statement that the most severe cases of brain and spinal syphilis occur within the first twelve months. Naunyn collected 209 cases from the literature, to which he added forty-five of his own. From his analyses he came to the conclusion that infection of the nervous system took place in the majority of instances during the first year, after which there was a decrease in frequency. Braus' statistics, made up of 100 cases in which a history was obtainable, showed that in nearly one-half the nervous system was involved within the first year. In Fournier's clinic twenty-six cases were shown to have developed within from three to six months after infection. Hutchinson's fifteen cases of spinal syphilis appeared from six months to three years after infection, while Savard found that out of seventy-seven cases of myelitis, twenty-six appeared from six to eight months after the chancre. These observations on the clinical side have been considerably augmented during the past few years by laboratory findings.

In 1903 Ravaut⁶ undertook a systematic examination of the spinal fluid in secondary syphilis and found abnormal changes in about 70 per cent. of the cases. At the same time he made note of an apparent parallelism between the type of cutaneous eruption and the findings in the spinal fluid, having been impressed by the more frequent occurrence of abnormalities with papular, pigmentary and psoriasiform lesions than with the roseola. Plaut⁷ also obtained a rather high percentage; namely, a definite pleocytosis in one-third of the cases and border-line results in another third, leaving only one-third negative. Nonne and Mantoux placed their positive findings at 40 per cent. From the examinations of Altmann and Dreyfus,⁸ chemocytologic changes were present in about 80 per cent. of patients in the secondary stage with remains of the initial lesion. Gennerich⁹ found positive findings in about 90 per cent. He is of the opinion that all early constitutional cases, that is, those in which the Wassermann has become positive, will after an injection of salvarsan or mercury develop an increase in lymphocytes and globulin. In other words, a provocative or Herxheimer reaction will be obtained in the fluid. This concurs with the studies of Ravaut, Levy-Bing, Duroex¹⁰ and Dogny. Altmann and Dreyfus made similar observations. One of their cases in the initial stage with a negative blood and spinal fluid showed, sixteen days after treatment with 1 gm. salvarsan, fifteen cells. Another with a negative blood and fluid sixteen days after 1.4 gm. salvarsan had a marked increase in pressure. Two months later, during which time an additional 1.5 gm. had been given, twelve cells were found. Another patient in the early secondary stage with normal fluid was given 0.4 gm. salvarsan. Seven weeks later the patient had facial and acoustic paralysis with 180 cells and a strongly positive Wassermann. This was a characteristic neurorecidive, a number of which cases were reported early in the salvarsan era, but are no longer met under our more intensive methods of treatment.

My own investigations up to the present time do not coincide with the high percentage of anomalies reported by other observers. In the absence of clinical symptoms pointing to involvement of the central nervous system in the early secondary stage, I have found abnormalities in the spinal fluid in less than 20 per cent. The headaches of the early secondary period are frequently unattended by changes, and appear to be due to a hypertension rather than a meningitis. In the later secondary and tertiary periods the cephalalgia is accompanied more usually by a lymphocytosis and other findings and is the precursor of cerebral accidents. I still have this subject under investigation and will report on it later. My view at this time, however, is that too much importance has been attached to trivial changes, as differences in pressure or slight increase in globulin, and that probably no larger percentage show marked anomalies than later develop definite nerve changes. That such cases may be the subject for years of a chronic meningitis without objective signs has been shown by the researches of Vincent,¹⁰ who was able to follow for a number of years patients with marked fluid changes and no clinical symptoms, who later developed severe organic changes in the central nervous system, some paresis. It therefore seems probable that cases of syphilis of the nervous system are recruited from those with a chronic meningitis or latent residua, for we know that the older the infection becomes the greater is the tendency to localization or tertiarism. Whether or not a new infection or dissemination of spirochetes can take place from an old focus we must submit for future enlightenment. In this connection may be mentioned the positive inoculation obtained by Uhlenhuth and Mulzer¹¹ in a rabbit with the blood of a woman with latent syphilis, who had been delivered shortly before of a syphilitic child. Her infection dated back four years.

Clinical observations have taught us that only a minority of syphilitic individuals develop obtrusive nervous symptoms. Even under the old and inadequate methods of treatment the percentage is not very high. This may be accounted for partly by less complete methods of diagnosis, as the majority of statistics were compiled before the application of the Wassermann reaction or the lumbar puncture. Hjelmman placed his figures of cerebral syphilis at from fifteen to twenty-five per thousand. Raumont found that of 3,400 cases, 290 suffered from syphilis of the nervous system. Fournier's investigations of 4,329 cases of tertiary syphilis elicited diverse nervous manifestations in 1,085, of which 416 showed involvement of the cerebrospinal axis with more or less diffuse lesions. Pick and Bandler followed the fate of 2,066 cases, in the Prague clinic between the years 1879 and 1899 and found that 4.25 per cent. had developed parasyphilis. Most valuable are the statistics of Mattauschek and Pilcz.¹² In an admirable and painstaking manner they investigated the course of the disease in 4,134 officers in the Austrian army who had been infected during the years 1880 to 1900, and found that 198 developed paresis and 113 tabes, not counting those who later became paretic. Of the total number of tabetics 11.93 per cent. developed paresis; 8.18 per cent. had optic atrophy, not including the cases of

5. Mott: A System of Syphilis, iv.

6. Ravaut: Ann. de derm. et de Syph., 1903, iv, 1.

7. Plaut, Rehm and Schotmüller: Leitfaden zur Untersuchung der Zerebrospinalflüssigkeit, Fischer, 1913.

8. Altmann and Dreyfus: München. med. Wchnschr., 1913, Nos. 9 and 10, pp. 464 and 531.

9. Gennerich: Die Liquorveränderungen in den einzelnen Stadien der Syphilis, Berlin, Hirschwald, 1913.

10. Vincent: Des méningites chroniques syphilitiques, thèse, 1910.

11. Uhlenhuth and Mulzer: Beiträge zur experimentelle Pathologie und Therapie der Syphilis mit besonderer Berücksichtigung der Impf-Syphilis der Kaninchen, 1913.

12. Mattauschek and Pilcz: Ztschr. f. d. ges. Neurol. u. Psychol., 1913, xv.

taboparesis; 132 patients suffered from cerebrospinal lues, most frequently the endarteritic form, and eighty other cases showed various psychoses.

Dreyfus examined 104 patients with latent syphilis, none of whom had symptoms pointing to involvement of the central nervous system. He found 77 per cent. normal. Of the remaining 23 per cent., only 12 per cent. showed marked changes. Inferring that the majority of patients suffer from meningeal involvement at the beginning of the infection, we must also infer that in a large percentage, cure takes place in spite of lack of or insufficient treatment, for in the cases under discussion Dreyfus mentions that treatment had been only symptomatic and far from adequate according to our present notions.

This leads us to another angle of the problem, namely, the question of "lues nervosa." It has long been the belief of syphilologists and neurologists that in nerve syphilis we are dealing with a different form of the infection. This had its origin in the observation of conjugal and family groups of metasyphilis as well as in persons infected at a common source. The question has been whether the factors which determine the later development of nervous syphilis reside in the infecting agent or in the host. Nichols¹³ has recently expressed the opinion that such spirochetes possess a highly invasive power rather than a neurotropic action. His deduction rests on the results he obtained with a strain isolated from the nervous system. He found that they had a thicker form and a shorter incubation period, producing in rabbits hard lesions with necrotic centers and showing a tendency to generalize with lesions of the skin and eye, following local inoculation of the scrotum and testicle. Steiner's experiments with rabbits showed that in only a few cases the nervous system is involved, in some the lesions are in the brain, in others in the cord. Dörfflein's work with the spirochetes of relapsing fever is perhaps also pertinent in showing that species, geographically separated, possess different biologic properties which are not distinguishable morphologically.

I have many times noted the involvement of the nervous system coincidently in husband and wife, and have at present under observation a woman with cerebrospinal syphilis whose husband had a paraplegia, a man with paresis whose child had hydrocephalus and a couple with taboparesis. Fischer¹⁴ found among 500 paretics conjugal metasyphilis in 10.2 per cent. In Fischler's¹⁵ analysis, husband and wife had general paralysis 26 and tabes 31 times; the husband tabes and the wife paresis 4 times, vice versa 15 times; both cerebrospinal syphilis 4 times; husband tabes and wife cerebrospinal syphilis once, and husband paresis and wife cerebrospinal syphilis once. Of the hereditary cases he found that when one parent had paresis the child had paresis 12 times and tabes 5 times. When one parent had tabes the child had tabes 10 times and paresis 3 times. It has been noted that when the types of conjugal metasyphilis are dissimilar, the man more often suffers from paresis and the woman from tabes.

Experience has demonstrated that many luetic affections of the nervous system are amenable to the treatment ordinarily employed, that is, mercury by injection or inunctions or by a combination of mercury with potassium iodid internally. The lesions which are responsive to treatment of this kind are certain types

of endarteritis, localized gummas, periostitis involving the meninges and disseminated forms of meningitis. There are, however, some forms of gummas and chronic meningitis with severe headaches and endarteritis with symptoms, such as irritability, loss of memory, and inability to concentrate, which do not yield to the old treatment, as well as the types of syphilis formerly described under the names of parasyphilis or metasyphilis. The latter were so resistant to treatment that it had long led to the belief that they were only indirectly related to the infection—rather the result than the direct effect of the action of the organisms. The investigations of Noguchi and Moore demonstrating the presence of spirochetes in the lesions of paresis and tabes have, however, definitely placed these so-called parasyphilitic affections among the active lesions of syphilis.

In the treatment of syphilis of the nervous system the important points to emphasize are first, accurate diagnosis with serologic findings, second, necessity of prolonged treatment, third, the avoidance of too large initial doses until the susceptibility of the patient has been determined, and fourth, persistence in treatment in spite of absence of amelioration following the first few injections.

The criticism of the results of treatment of the nervous system by writers who have noted no improvement or an aggravation of symptoms depends on the superficial way in which it has been carried out. No judgment can be rendered until patients have been subjected to a sufficiently long treatment to influence permanently the pathologic changes in the cerebrospinal fluid. They must be kept under continuous observation for a period of years, and until the four phases of Nonne have become negative, no assurance can be given against relapses. In other words, since the infection of the nervous system is more difficult to reach, and hence more persistent, the treatment should be carefully controlled not only by clinical results but also by lumbar puncture. We cannot form any conception of the activity of the process from the symptoms alone. The latter sometimes are out of all proportion to the laboratory findings. There are at present under my care two patients in both of whom the only complaint was headache and a feeling of malaise. In the one a cell-count of 314 with double plus globulin and positive Wassermann to 0.2 cc. was found. In the other there was present a pleocytosis of 746 cells, a great excess of globulin and a positive reaction to 0.025 c.c.

It is not possible at present to give a characteristic serologic picture for cerebrospinal lues, tabes and paresis. Bearing in mind that there are transitional or border-land forms, it is necessary to supplement laboratory findings with careful and minute clinical examinations. To obtain a proper conception of the serologic findings in early tabes, repeated examination of the fluid should be made in all patients presenting symptoms pointing to involvement of the nervous system. Many cases of tabes give a previous history of oculomotor paralysis, facial palsy, headaches, somnolency, irregularity of the pupils or other evidence of meningitis of the base. In other cases in which the process is limited to the lower cord, these early symptoms are lacking. With the acquisition of further data we may be able from a group of symptoms and spinal fluid findings to foretell the subsequent development of tabes. Gummas or endarteritic changes in the nervous system frequently occur, but recovery takes place

13. Nichols, Henry J.: *Jour. Exper. Med.*, 1914, xix, No. 4.

14. Fischer, Oscar: *Ztschr. f. d. ges. Neurol. u. Psychol.*, 1913, xvi.

15. Fischler: *Deutsch. Ztschr. f. Nervenheilk.*, 1905, xxviii.

without secondary tabes or paresis, while cases with meningitis of the base may be followed by either of these conditions. The closer these conditions are studied from a serologic and anatomic point of view, the less likelihood is there that they are due to a primary neuron degeneration. Nonne¹⁶ is of the opinion that they are the result of a meningitis and refers to the work of Schröder, Meyer and Oppenheim demonstrating inflammatory changes in the pia and connective tissue passing from it to the blood-vessels. Nageotte also found a true inflammation with lymphocytes and plasma-cell infiltration about the root-fibers, as well as inflammatory changes in the arteries and veins. Stargardt likewise demonstrated a true inflammation of the sheath and endoneurium of the optic nerve in cases of tabes and paresis. It is possible for the specific infection to be limited to the cerebrospinal fluid, the blood being entirely free from the infection. This is proved by the negative findings in the blood and the positive ones in the fluid. It has also been demonstrated that the interchange between the blood and the spinal fluid is so slight that drugs introduced by the blood-stream diffuse themselves very little if at all in the spinal fluid. This fact explains the resistance of certain types of syphilis to the ordinary methods of treatment. Why this is so in one case and not in another is difficult to explain, unless we assume a more pronounced endarteritis in one case than in another or greater permeability of the choroid plexus. No matter what the theoretical considerations are, practical results show that the cells and other abnormalities can be influenced by intravenous treatment, although this takes place more slowly than with the direct method. That the latter is not only local in its action is shown by the change of a positive to a negative reaction in the serum by the exhibition of this treatment only.

The intraspinal method has placed the treatment of syphilis on a more accurate and scientific basis. As first applied by Swift and Ellis,¹⁷ it consisted of injecting into the subarachnoid space salvarsanized serum, that is, the serum from a patient treated intravenously with the drug one hour before. Diluted with normal saline it is given in strengths varying from 40 to 100 per cent. This method has been modified by Dr. Hanson S. Ogilvie by incorporating salvarsan with human serum direct *in vitro*, and has the advantage of standardizing the dose. For the procedure his technic is as follows:

Fifty c.c. of blood are drawn into a centrifuge bottle and centrifuged twice. It is important to have the serum clear and free from fibrin and blood-cells. To obtain the requisite amount of the drug, old salvarsan is mixed in the usual way in the proportion of 0.1 gm. to 40 c.c. of fluid, care being taken not to over alkalinize; 0.4 c.c. of this solution is the equivalent of 1 mg., and is taken as the standard for measuring the dosage. For this purpose a 1 c.c. pipet graduated in hundredths should be employed. The desired amount of salvarsan is added to from 12 to 15 c.c. of the serum, shaken to and fro to mix thoroughly, and then placed in the incubator at 37 C. (98.6 F.) for one hour, after which it is inactivated for half an hour at 56 C. (132.8 F.). The latter is a most important step in the technic, as Swift and Ellis demonstrated that the spirocheticidal properties of the serum were markedly increased by heating.

In experimenting with trypanosomes, Stühmer¹⁸ found that the curative action of unheated salvarsanized serum lasted twenty-four hours, and its protective action forty-eight hours, while in the heated serum the curative action was still present at the end of three days and the protective action four days. In comparing the relative values of salvarsan and neosalvarsan, he found that whereas the former was still active after forty-eight hours and often seventy-two hours, neosalvarsan lost its parasitocidal powers after twenty-four hours.

Salvarsanized serum prepared according to the method of Ogilvie must be used fresh, that is, within three hours of the time that it is made up. Patients should be prepared for its administration as for the intravenous injection, with a laxative the night before and only a light meal two hours prior to the treatment.

A lumbar puncture is made and an amount of fluid equivalent to the amount introduced is withdrawn. While the needle is *in situ*, the barrel of a Luer syringe is connected by means of a piece of rubber tubing. Spinal fluid is allowed to fill this to expel the air and the serum is then permitted to flow in by gravity. After its administration the patient should lie flat without any pillows, the foot of the bed being elevated for several hours. He must be kept in bed for at least twenty-four hours, in some cases forty-eight or seventy-two hours. Failure to do this may result in unpleasant symptoms, as pain in the extremities, headache, anesthesia, and bladder and rectal paresis.

The proper dose is still in a stage of evolution and a note of warning must be sounded against employing too large amounts. From my experience during the last months I feel that the limits of safety lie within 0.5 mg. It is better to begin with a dose of 0.25 mg., repeating or gradually increasing according to the tolerance of the patient. The intervals should be two weeks or longer. In a number of patients, when larger doses were given and the intervals were only a week apart, unpleasant by-effects were noted. These may come on within a few hours or be delayed for six days and may persist several weeks. The symptoms consist of root-pains, numbness, bladder and rectal paresis in some, irritability of the bladder in others, and ataxia. The numbness in some cases involved the whole lower portion of the body, in others the gluteal region and the legs with areas of hyperesthesia on the inner thighs.

On the Continent, where neosalvarsan is employed intraspinally, Marinesco and Minea¹⁹ and Ravaut²⁰ have given as much as 12 mg. at a dose. These large doses were followed in a number of cases by severe reactions.

On account of the technical difficulties connected with subarachnoid injection it is well to inaugurate the treatment of nerve syphilis with a few mercurial injections and follow this up by a course of intravenous injections of salvarsan, beginning with a dose of not more than 0.25 or 0.3 gm. and repeating these injections at varying intervals of from one to two weeks. At the end of six or eight such injections lumbar puncture should be repeated; and if a marked effect has not been obtained either clinically or serologically, a course of intraspinal injections should be seriously considered, the number and intervals to be governed by the reaction produced. Should at any

16. Nonne: Die Lues-Paralyse-Frage, Arch. f. Derm. u. Syph., 1914, cxix, 215.

17. Swift, H. F., and Ellis, A. W. M.: Jour. Exper. Med., 1913, xviii, No. 4; The Treatment of Syphilitic Affections of the Central Nervous System with Especial Reference to the Use of Intraspinous Injections, Arch. Int. Med., September, 1913, p. 331.

18. Stühmer: München. med. Wchnschr., 1914, No. 14, p. 745; *ibid.*, 1914, No. 20, p. 1101.

19. Marinesco and Minea: Bull. de l'Acad. de méd., Feb. 2, 1914.

20. Ravaut: Ann. de Méd., 1914, No. 1, p. 49.

time symptoms of irritation manifest themselves; the patient should rest until they entirely disappear.

In the types of disease in which the symptoms are urgent and an immediate effect is desired, there can be no objection to beginning the intraspinal treatment without the antecedent intravenous employment of the drug, but better results are obtained by combining the two routes of medication. It must be borne in mind that a definite plan of treatment has not yet been formulated but that we are in a state of developing a method which seems to offer far more hope of influencing these resistant forms of syphilis of the nervous system than any heretofore employed.

Cases of tabes which are rather acute in their development, and have a high pleocytosis and positive Wassermann are advantageously treated by the combined use of mercury with the method outlined. In those accompanied by marked degenerative changes mercury may hasten the process. It therefore must be employed only after a careful analysis of the symptoms and serologic findings. An indication for intraspinal treatment alone would seem to be present in those cases in which we have a negative Wassermann in the blood and a positive one in the cerebrospinal fluid.

As I believe the results obtained with neosalvarsan are inferior to those obtained with salvarsan, I have practically given up the use of the former. It has been shown by Stühmer that, owing to its quicker elimination, its action is much shorter than that of salvarsan. While in each the maximum effect is produced within the first twenty-four hours, it practically ceases on the second day in the case of neosalvarsan, whereas in the case of the old he still found active traces at the end of a week.

The following group of cases is submitted to show the effect of intravenous and of intraspinal medication. Many of the patients had been treated for long periods of time by mercury and potassium iodid without improvement, and while the results are not uniform in all cases, in a number the improvement in the clinical and serologic symptoms is so striking as to encourage us in the further development of the method.

CASE 1.—Tabes. Man, aged 40, married, salesman. Syphilis eight years ago.

Symptoms: For one year pains in the legs, girdle sensation and marked ataxia. Absent reflexes; Argyll Robertson pupils.

Cerebrospinal Fluid; March 11, 1913: Cells 70, globulin ++; Wassermann ++ to 0.4 c.c.; serum ++.

Treatment: From March to June, eight injections of neosalvarsan, totaling 5.7 gm., and weekly injections of salicylate of mercury. No benefit resulted and treatment was discontinued. From Sept. 5 to Oct. 11, 1913, four injections of salvarsan amounting to 1.6 gm. Condition showed no change. Nov. 21, 1913, he was given an intraspinal injection of a 40 per cent. exogenous salvarsanized serum fortified with 0.25 mg. salvarsan. The effect of this treatment was cessation of the girdle-pains. Subarachnoid injections were continued until the middle of April, when he received the eighth with 1 mg. of salvarsan.

Cerebrospinal Fluid; April 16, 1914: Cells 0, globulin —, Wassermann ++ to 0.4 c.c.; serum ±.

Clinically a most radical change had taken place. The patient's nutrition had improved, he had gained in weight and no longer suffered from pain. The improvement in his gait was marked and he was able to go about unassisted.

Cerebrospinal Fluid; May 29, 1914: Cells 0, globulin —, Wassermann ++ to 0.8 c.c.; serum ++.

Treatment: Two intraspinal injections of 3 mg. and 3.5 mg., respectively. The latter was followed by severe root-pains.

This case is a very striking illustration of the value of subdural treatment, as there was absolutely no

amelioration in the symptoms from the other forms of treatment but a steady progression. Attention is called to the benefit obtained from the small doses and the error made in the large increase.

Blood-serum examined June 10, 1914, —.

CASE 3.—Tabes. Man, aged 55, married. Syphilis, 1901. Symptoms of tabes since 1906.

Treatment: From 1906 to 1912 injections of mercury. From April to October, 1912, six injections of salvarsan.

Cerebrospinal Fluid; Oct. 19, 1912: Cells 87, globulin ++, Wassermann ++ to 0.6 c.c.

Treatment: Three injections of neosalvarsan during the next year.

Cerebrospinal Fluid; Oct. 28, 1913: Cells 97, globulin ++, Wassermann ++ to 0.2 c.c.

Treatment: Five injections of neosalvarsan; Feb. 9, 1914, 0.5 mg. and March 10, 1914, 0.75 mg. salvarsan intraspinally.

Cerebrospinal Fluid: Cells 7; globulin ++, Wassermann ++ to 0.1 c.c.

Clinically: Improvement after intraspinal treatment marked. The pains in the legs disappeared, the patient no longer suffered from insomnia which had troubled him for many months and in every way his condition improved. This case also emphasizes the necessity of systematic and energetic treatment, as shown by an intensification of the process revealed by puncture under an irregular treatment of only three injections of neosalvarsan during the year.

CASE 6.—Tabes. Man, aged 55, married, broker. Syphilis twenty-six years ago with mild secondary eruption.

Symptoms: For past ten years pains and unsteady gait. During past year double vision, paralysis of the right external rectus, slight facial paralysis and attacks of vertigo. Knee-jerks absent; Romberg; pupils small, fixed to light and irregular outline, atrophy of the right nerve.

Cerebrospinal Fluid: Cells 45, globulin ++, Wassermann ++ to 0.4 c.c., serum Wassermann weakly +.

Treatment: From Feb. 16 to March 26, 1914, weekly injections of salvarsan averaging 0.3 gm. Early in April the patient had several attacks of motor weakness in the legs accompanied by temporary loss of consciousness, visual disturbance and attacks of aphasia. These symptoms were probably due to endarteritis and change in blood-pressure: May 5 he was given an intraspinal injection of 1 mg. of salvarsan, which was followed by retention of urine and vomiting lasting several days. May 14, 1914, 1 mg., May 20, 1.5 mg., and June 10, 0.5 mg. salvarsan were given subdurally.

Cerebrospinal Fluid: Cells 8, globulin ++, Wassermann —.

Clinically, the aphasia and motor weakness of the right upper extremity have disappeared, he is free from pain and his ataxia has improved some.

CASE 7.—Tabes and optic atrophy. Man, aged 52, married. Syphilis twenty-eight years ago.

Symptoms: For past sixteen years pains in the legs. Several years ago diplopia. Knee-jerks absent; marked ataxic gait. Pupils small and immobile, optic nerves pale, the right more so. Vision, right, 18/200, left 18/20.

Cerebrospinal Fluid; March 31, 1913: Cells 150, globulin ++, Wassermann ++ to 0.8 c.c., + to 0.6 c.c.; serum —.

Treatment: April 9, 1913, 0.45 gm. neosalvarsan, April 16, 0.6 gm. neosalvarsan. Latter was followed by increase in pain, diminished secretion of urine, delirium, and tremor of the hands, continuing until the 21st. From May 13 until June 23, six injections of neosalvarsan, a total of 2.85 gm., without any reaction.

Cerebrospinal Fluid: June 26, 1913: Cells 15, globulin +, Wassermann ++ to 0.2 c.c.

Treatment: Sept. 22, Sept. 29, Oct. 6 and Oct. 18, 1913, 30 c.c. of from 40 to 80 per cent. salvarsanized serum intraspinally, after the method of Swift and Ellis.

Cerebrospinal Fluid: Cells 8, globulin —, Wassermann —.

A period of rest followed this treatment.

Cerebrospinal Fluid; May 13, 1914: Cells 5, globulin ++, Wassermann very weak + with 1.0 c.c.; blood-serum very weak +.

Clinically, the pains have all gone, the ataxia is unchanged and the sight has remained stationary during the past year.

CASE 8.—Tabes. Man, aged 32, single. Initial lesion four-teen years ago; no secondaries.

Symptoms: Four years ago slight numbness of the toes. Six months later loss of coordination and now the typical symptoms of tabes.

Cerebrospinal Fluid: Cells 34, globulin ++, Wassermann ++ to 0.2 c.c.; serum ++.

Treatment: From Feb. 12 to May 5, 1913, ten injections of neosalvarsan, 7.1 gm., sixteen injections of mercuric chlorid, from 1/3 to 1/2 grain, and twenty-five inunctions.

Result: Marked improvement. The patient was stronger and had regained confidence, his walk had improved markedly and he was able to return to his work.

Cerebrospinal Fluid; June 2, 1913: Cells, 7, globulin —, Wassermann, —; serum —.

From that time until he presented himself again in March, 1914, he had had no treatment.

Cerebrospinal fluid, negative; serum ±.

There had been no clinical relapse except slight pains in the legs. Under a provocative injection of 0.3 gm. salvarsan, his blood-serum became strongly positive. After two more injections he was again punctured.

Cerebrospinal Fluid: Cells 5, globulin ±, Wassermann ++ with 1 c.c.

This case illustrates several points: first, the possibility of influencing the serologic findings along with the clinical symptoms by intense and regular treatment; second, the necessity of keeping patients under observation after negative findings are obtained, and third, the value of provocative injections. Since the latter the patient has had five intravenous injections of salvarsan, averaging 0.4 gm. each. He no longer suffers from pain, the bladder and bowels are normal, sexual power has steadily improved during the past year and there is scarcely any perceptible ataxia in his walk. When he first came under treatment his ataxia was so pronounced that he could not get about without assistance. He now walks daily from 5 to 7 miles, registered by a pedometer.

CASE 9.—Optic atrophy. Woman, aged 48, married, housewife. No history of infection; husband infected six years ago.

Symptoms: Five years ago double vision and other ocular disturbances. When seen in October, 1912, the patient had optic atrophy. Vision of the right eye 20/50; left, fingers at 4 inches.

Cerebrospinal Fluid; Oct. 16, 1912: Cells 24, globulin +, Wassermann ++ with 1 c.c., + to 0.6 c.c.

Treatment: Fourteen injections of neosalvarsan, 9 gm., and seven injections of salvarsan, 2.5 gm., accompanied by injections and inunctions of mercury.

A very noticeable improvement had taken place in the physical condition of the patient. All the headaches had ceased; the vision in the right eye was 20/20 and in the left fingers at 2½ feet.

Cerebrospinal Fluid; July 17, 1913: Cell 1, globulin —, Wassermann ++ with 1 c.c., and + with 0.8 c.c.; serum ++.

The benefit which this patient derived from treatment greatly exceeded the hopes of those familiar with this class of cases. The condition has been stationary for a year, without treatment, but the positive reaction of the spinal fluid and of the blood show the necessity of further combating the disease to hold the ground gained.

CASE 14.—Tabes. Man, aged 31, married, salesman. Syphilis nine years ago with secondaries.

Symptoms: Three years ago blurred vision and dilatation of left pupil. Now Argyll Robertson pupils; gastric crises; absent reflexes; slightly ataxic gait. Serum ++.

Treatment: In February, 1911, three injections of salvarsan, each 0.35 gm., followed by mercury.

Cerebrospinal Fluid; Oct. 10, 1912: Cells 43, globulin ++, Wassermann ++ to 0.4; blood-serum ±.

Treatment: Eight injections of neosalvarsan, 5.25 gm., along with mercurial treatment.

Clinically, the first two treatments were followed by a temporary improvement, but after several months there was a return of leg-pains, insomnia, loss of sexual power, weakness, etc. After the second course a definite change took place. The patient has gained in weight, the gastric crises and pains have ceased and his gait is normal.

CASE 15.—Taboparesis. Man, aged 38, married, manufacturer. Syphilis December, 1903, followed by secondaries. A marked cutaneous relapse in August, 1904; persistent eruption of the palms in 1905.

Symptoms: When seen in November, 1911, he had suffered from delusions of grandeur for two weeks. Eye-reflexes sluggish; knee-jerks absent.

Treatment: From Nov. 11, 1911, to Oct. 7, 1912, eleven injections of salvarsan, 4.2 gm., and seven injections of neosalvarsan, 4 gm., with mercury in the form of inunctions and injections.

Cerebrospinal Fluid; Oct. 10, 1912: Cells 86, globulin ++, Wassermann ++ to 0.2; serum ++.

Physical Examination. No sensory changes, station and gait normal. No paresthesia, no bladder or rectal trouble; both pupils very sluggish to light and accommodation. Mental examination negative except for a few obsessions with slight tendency to depression. No speech or writing defect.

Treatment: Injections of mercury to Jan. 31, 1913, and then discontinued.

Relapse: March 3, 1913 there was an epileptiform convulsion, and the patient was unconscious for twenty minutes. Nervous and excitable.

Treatment: Seven injections neosalvarsan, 4.65 gm., two salvarsan, 0.9 gm.

Relapse: In June, 1913, the patient became disoriented. Delusions and hallucinations both visual and auditory were very marked. He was extremely noisy and at times violent so that it was necessary to place him in a sanatorium and keep him under the influence of sedatives.

Treatment: July 16, 1913, an intraspinal injection of 30 c.c. of a 40 per cent. solution of salvarsanized serum after the method of Swift and Ellis; July 26, second injection; he became quieter and more tractable; August 4, third injection; distinct improvement the following week. He took his food and slept better, and grandiose ideas were less marked, but delusions of persecution persisted. August 14, fourth injection. After thirty minutes a mild convulsion. August 22, fifth injection. Steady improvement and only a tendency to be aggressive toward attendants and physicians. August 29, sixth injection. September 4, an intravenous injection of 0.45 gm. and on the following day an intraspinal injection. During the succeeding week a definite improvement in every way. He was brighter, had an insight into his condition, grandiose ideas practically disappeared and he was permitted to return to his home. Five more intravenous and five intraspinal injections were given.

Cerebrospinal Fluid; Oct. 21, 1913: Cells 6, globulin +, Wassermann ++ to 0.2 c.c. The first of the year he returned to business and during the month of February had one intravenous and one intraspinal treatment of salvarsanized serum.

Relapse: The latter part of March his brother died suddenly. This was followed by marked depression, insomnia and loss of weight.

Treatment: April 4, 1914, 0.75 mg. salvarsan subdurally; April 9, 0.4 gm. intravenously. April 23 the patient had a convulsion. April 25, 1.5 mg. intraspinally.

Cerebrospinal Fluid; April 25, 1914: Cells 15, globulin ++, Wassermann ++ to 0.05 c.c.

Treatment: May 12, 2 mg., May 22, 3 mg. intraspinally. The latter was followed by vesical incontinence persisting for several days.

Cerebrospinal Fluid: Cells 4, globulin ++, Wassermann ++ to 0.05 c.c.

Summary: Patient has received twenty-one injections of salvarsan, totaling 8.65 gm. fifteen of neosalvarsan, 9.25 gm.,

thirteen intraspinal injections of salvarsanized serum varying in strength from 40 to 100 per cent. (Swift-Ellis method), and five intraspinal injections in dosage from 0.75 to 3 mg. salvarsan, besides several courses of mercury by injection and inunction. At present he is normal again excepting for slight mental indecision.

CASE 18.—Cerebrospinal syphilis. Man, aged 29, single, clerk. Syphilis five years ago with secondaries.

Symptoms: Pupils sluggish, knee-jerks hyperactive, impotence for last two years.

Cerebrospinal Fluid; Feb. 2, 1913: Cells 46, globulin ++, Wassermann ++ to 0.6 c.c., $\pm$ to 0.4; serum —.

Treatment: Six injections neosalvarsan, 4.5 gm., six injections of salvarsan, 3 gm., and 100 grains of mercury salicylate from March 1 to June 1, 1913. This was followed by a period of rest to Nov. 4, 1913.

Cerebrospinal Fluid; Nov. 4, 1913: Cells 0, globulin —, Wassermann —.

This case shows the importance of lumbar puncture for the blood was repeatedly negative and remained so under provocative treatment, as well as the effects of a concentrated therapeutic attack.

Clinically, the symptoms gradually improved.

CASE 20.—Cerebrospinal syphilis. Man. A patient in the City Hospital. Syphilis three and one-half years ago.

Symptoms: For three weeks headaches and leg weakness; pupils fixed to light and accommodation. Patient also has multiple gummas of right leg.

Cerebrospinal Fluid: Cells 746, a very marked excess of globulin, the fluid coagulating almost solid, and a positive Wassermann to 0.05 c.c.

Treatment: Salvarsan, 1.5 mg. intraspinally; one week later the cell-count was down to 174 with a reduction in the globulin but no change in the Wassermann. The headaches were absent and the weakness in the legs had improved. After an injection of 3 mg. salvarsan intraspinally the cells dropped to 70, but the Wassermann was not influenced. The patient is now being systematically treated.

CASE 22.—Cerebrospinal lues. Man, aged 58, married, manufacturer. Syphilis thirty-five years ago. Deafness twenty years ago.

Symptoms: Fifteen months ago pains in lower extremities and ataxic gait; about a year ago partial paralysis of the left arm and leg and left side of face. This was followed two months later by a second hemiplegic attack with an epileptiform convulsion; patient unconscious for two hours. Pupils irregular and sluggish, knee-jerks absent, marked Romberg, pains and bladder weakness.

Treatment: Oct. 11, 1911, 0.2 gm. salvarsan and Nov. 3, 1911, 0.35 gm. salvarsan. These were both followed by an aggravation of symptoms, namely, the pains and twitching in the legs and vesical insufficiency. Two weeks later there was a remission in these symptoms and gradual improvement. Jan. 1, 1912, 0.3 gm. salvarsan, which was not followed by any reaction except loss of control of bladder during the night following the injection. During the next few months there was a gradual improvement in every way.

Cerebrospinal Fluid; Oct. 6, 1912: Cells 18, globulin ++, Wassermann ++ to 0.8 c.c.; blood-serum —.

Treatment: Six injections of neosalvarsan, 2.5 gm., were given. When seen in January, 1914, the patient had had no treatment for a year, the pupillary reflexes had become more active and the bladder function normal. His gait improved as well as his coordination. He is able to ride horseback and walk miles without fatigue. His blood-serum was —. It was not possible to do another puncture at this time.

CASE 23.—Endarteritis. Man, aged 49, married, manufacturer. Syphilis twenty-two years ago.

Symptoms: A year and a half ago the patient developed an attack of "pounding" in the ears followed instantly by sharp, severe pains in the head and unconsciousness for twenty-four hours. His vision remained blurred for many weeks and he had difficulty in articulating. He was very weak but had no definite palsies.

Treatment: Seven injections of neosalvarsan and mercury. Steady improvement took place.

Cerebrospinal Fluid; Feb. 20, 1913: Cells 6, globulin —, Wassermann ++ to 0.6 c.c., blood-serum ++.

Treatment: From Feb. 24 to March 22, 1913, he had five more injections of neosalvarsan, totaling 3.6 gm.

Clinically, no headache, no dizziness and patient feels normal.

In estimating the results obtained by the intensive treatment of syphilis of the nervous system one must not forget the influence of the psychologic effect of a new method of treatment and the fact that in many cases of tabes and paresis there are periods of remission covering months or years. Observations of this kind, however, were made before we employed the more precise methods of diagnosis and controlled our treatment by means of the examination of the spinal fluid. Furthermore, many of our most striking results have been obtained in patients who had long-continued and marked symptoms such as girdle sensation, pains and impairment of locomotion. The change in the clinical symptoms as well as the serologic findings would certainly give us strong presumptive evidence that the results were due to an actual improvement in the condition and not a normal remission.

Each case is a problem in itself and must be approached in an individual manner. Different pathologic conditions are present, so that while on the one hand we have an active process, on the other there is a degenerative one, complicated perhaps with an endarteritis, softening or scar formation. Symptoms which are due to interference with nutrition or pressure we cannot expect to influence.

When salvarsan is employed it should be done so intensively and combined with mercury. The criticism of certain writers against the employment of salvarsan in the secondary stage of syphilis is entirely fallacious, for we know that when it is given in the proper manner combined with mercury, the so-called neurorecidives do not occur. In an experience of over two years, during which this method of treatment has been followed, not a single case of nerve recurrence has been observed.

The cases submitted show that it is possible in some instances by intravenous medication alone to influence the clinical and serologic findings, and when this does not take place the only alternative may be intraspinal medication. Until we are more familiar with the effects of serum fortified *in vitro*, the Swift and Ellis method of salvarsanizing serum *in vivo* should be the one of choice. In certain cases the serum from a patient so treated may be reinforced with from 0.25 to 0.5 mg. of salvarsan. It must always be borne in mind that the spinal cord reacts intensively to irritants even of a mild grade. When a degenerative process is present the resistance of the cord is much below that of a normal one and the brunt of the irritation falls on the degenerated areas.

I am convinced that the intelligent and energetic treatment of the infection in the early stages properly controlled by the serum reaction would do much to prevent the subsequent development of nerve syphilis. It must, however, be thorough to eliminate the possibility of residual foci, which experience has taught have a predilection for the meninges. The early history of salvarsan shows that these accidents occur more precipitately after its use than under the older and milder methods of treatment.

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THE SERO-ENZYME TEST FOR SYPHILIS *

F. W. BAESLACK, M.D., M.A.

DETROIT

Through the parenteral incorporation of foreign or changed protein into the organism we may observe the formation of enzymes in the blood of the body. These enzymes do not occur in the blood normally, but their presence is contingent on the entrance of blood-foreign substances. Conversely we are able to prove the occurrence of these enzymes in the blood by dialyzing such serum against the protein which gave rise to the enzymes.

The formation of these enzymes may be stimulated in the experiment at the will of the investigator, or it may take place in diseases of infectious origin, when the organisms themselves or the products of their action on the cells of the body, or both, are swept into the blood-stream and there cause the development of ferments which are capable of breaking up the complex foreign substances into their simpler non-specific component parts, which are either assimilated or thrown off. In this respect the normal and abnormal functions of the body differ quantitatively—for while, under normal conditions, the cells of the body split the complex specific molecules into simpler non-specific parts, there is added, under certain conditions, either physiologic or pathologic, the action of the ferments present or increased in the blood-serum which have the same function, namely, to split specific bodies into their non-specific components.

The work of Abderhalden has called attention to the formation and action of these ferments in pregnancy, in the course of which either chorionic epithelium or the products of the active metabolism as occurring in the syncytium may find their way into the blood-stream. Later Abderhalden extended his investigations to the diagnosis of neoplasms.

The controversy concerning the applicability of the dialyzing method for diagnostic purposes has found a fertile field in the sero-enzyme reaction for cancer, and a large number of observations have been made, which speak against the reliability of this method of diagnosis in this disease as far as it has been possible to determine, the failures may be due to a variety of causes, aside from possible errors in technic.

It is practically impossible to obtain cancer-tissue free from the connective-tissue stroma. The reaction for connective tissue is the same. This may be the reason why certain serums give positive reactions in other conditions than those clinically apparent. As the cancer invades an organ, there is usually degeneration of the neighboring tissue-cells and a consequent occurrence of protective enzymes in the serum of the patient against this cell protein. In addition, the cancer-cell may retain traces of the functional activity of the tissue from which it originated. Finally, the occurrence of protective enzymes in the serum is dependent on the breaking up of tissue in the blood and on the resorption of such broken-down tissue. Thus, an actively growing neoplasm may not give off cancer protein at all or may give it in such small quantities that the enzymes directed against it are not demonstrable. For these reasons the choice of the sero-enzyme diagnosis for neoplasms may not

have been a happy one to bring the conflicting conclusions into any relation. The use of homologous cancer-tissue, that is, tissue from patients who had the new growth in the same relation as that of the suspected patient, may possibly shed some light on this line of work. At least these contradictory results are no reason for excluding this method of diagnosis from all clinical application.

The extraordinary significance of the work of Abderhalden from a clinical and purely scientific point of view should be a stimulus to further research to determine the factors which have given rise to these divergent results.

The infectious diseases offer a more promising field for this line of investigation, since, in the course of such diseases, the causative organisms find their way into the circulation and there give rise to the protective enzymes capable of digesting them. Aside from this, we have in syphilis a disease simulating many other conditions in which cell proliferation and destruction occur, so that the resorption of these broken-down foci by the blood will further stimulate the formation of enzymes against the protoplasm of the cells undergoing degeneration as the result of the presence of the *Spirochaeta pallida* in the body.

Two hundred serums, obtained mostly from patients of the outdoor clinics of St. Mary's Hospital, form the basis for this investigation. While work reported in a previous paper,¹ the majority of serums tested were obtained from known syphilitics, it has been my aim in this work to test serums of patients suffering from various complaints to determine the extent to which this reaction could be relied on as a diagnostic means.

The technic followed in the course of this work has been the same as was employed for the fifty-five cases already reported. The tissue employed was the same, namely, the "gummas" resulting from the inoculations of syphilitic tissue or blood into the testes of rabbits. These lesions become, in the course of a few transplantations from rabbit to rabbit, free from secondary infection. They are practically non-vascular and contain the *Spirochaeta pallida* in large numbers.

Tissues from syphilitic patients, such as condylomas, gummas, etc., are usually secondarily infected and very vascular, for which reasons they are not suitable as tissues for the sero-enzyme reaction. The testicular tissue which has undergone mucoid degeneration due to the presence of the *Spirochaeta pallida* is of special advantage in the sero-enzyme test in that we are making use of a highly specialized tissue, against which protective enzymes are not likely to be found in the serum of patients. Thus the sero-enzyme test becomes a specific biologic test for the diagnosis of this disease. While the Wassermann reaction is a valuable aid in the diagnosis of syphilis, the principles underlying this reaction are not yet understood after years of investigation and general use.

Table 1 gives the clinical diagnosis as well as the serologic findings of the two hundred cases.

Eighty-five, or 42.5 per cent. of the entire number of cases gave a history of specific infection. Table 2 gives the number of each case as well as the serologic findings.

* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Baeslack, F. W.: A Sero-Enzyme Diagnosis of Syphilis, THE JOURNAL A. M. A., March 28, 1914, p. 1002; Urol. and Cutan. Rev., May, 1914, p. 234.

TABLE 1.—DIAGNOSIS AND SEROLOGIC FINDINGS IN 200 CASES

Name	Case	Date	Age	Sex	Stage of Syphilis	History	Treatment	Wassermann Reaction	Sero-enzyme Test			Other Diseases and Complaints
									Syph.	Tuberc.	Goiter	
A. K.	1	2/ 4/14	25	♂	Primary, 5 weeks	+	—	+++	+	..	..	.....
M. D.	2	2/ 4/14	38	♂	Latent	+	+	+++	+	..	..	.....
L. S.	3	2/ 5/14	22	♂	Primary, 4 weeks	+	—	—	+	..	..	.....
C. S.	4	2/ 5/14	37	♂	Cerebral lues	+	+	+++	+	..	..	.....
Th. R.	5	2/ 6/14	76	♂	Gumma of testis	+	—	+++	+	..	..	.....
A. Y.	6	2/ 9/14	50	♂	.....	—	—	+++	+	..	..	Headache
A. C.	7	2/ 9/14	26	♂	Secondary	+	+	+++	+	..	..	.....
Th. M.	8	2/16/14	35	♂	Latent	+	+	+++	+	..	..	.....
M. M.	9	2/16/14	43	♂	.....	—	—	+++	+	..	..	Uncontrolled shaking of hands
J. M.	10	2/17/14	33	♂	Primary, 5 weeks	+	—	—	+	..	..	.....
G. C.	11	2/17/14	38	♂	Primary, 6 weeks	+	+	+++	+	..	..	.....
F. W.	12	2/20/14	34	♂	Gumma on arms	+	+	+++	+	..	..	.....
M. D.	13	2/20/14	40	♂	Latent	+	+	+++	+	..	..	.....
M. T.	14	2/23/14	36	♂	Latent	+	+	+++	+	..	..	.....
B.	15	2/23/14	27	♂	Ulcers in mouth	+	—	+++	+	..	..	.....
A. H.	16	2/24/14	23	♂	Primary, 5 weeks	+	—	+++	+	..	..	.....
S. H.	17	2/24/14	25	♂	Primary, 5 weeks	+	—	+++	+	..	..	.....
N. H.	18	2/25/14	23	♂	Primary, 4 weeks	+	—	+++	+	..	..	.....
L. B.	19	2/27/14	31	♂	Latent	+	—	+++	+	..	..	.....
B. S.	20	2/27/14	40	♂	Cerebral lues	+	—	+++	+	..	..	.....
B. S.	21	2/27/14	25	♂	Prim-second	+	—	+++	+	..	..	.....
J. E. J.	22	2/27/14	40	♂	.....	—	—	+++	+	..	..	Lupus vulgaris?
H. D.	23	2/27/14	..	♂	Latent	+	+	+++	+	..	..	.....
E. J.	24	3/ 2/14	21	♂	Primary, 2 weeks	+	—	—	+	..	..	Sore throat
E. J.	25	3/ 2/14	33	♂	Has child syphilitic	+	—	—	+	..	..	.....
E. G.	26	3/ 4/14	33	♂	Latent	+	+	+++	+	..	..	Pleurisy l. side
L. Th.	27	3/ 4/14	53	♂	.....	+	+	+++	+	..	..	Headache
A. S.	28	3/ 4/14	39	♂	Luetic neuroretinitis	+	+	+	+	..	..	.....
J. R.	29	3/ 6/14	21	♂	.....	+	+	+++	+	..	..	Chaneroid?
H. T.	30	3/ 6/14	38	♂	Latent	+	+	+++	+	..	..	.....
K.	31	3/ 6/14	29	♂	.....	+	+	+++	+	..	..	.....
D.	32	3/ 9/14	45	♂	Primary	+	+	+++	+	..	..	.....
Th. M.	33	3/ 9/14	60	♂	Cerebral lues	+	+	+++	+	..	..	Epileptic attacks
P. L.	34	3/ 9/14	19	♂	.....	+	+	+	+	..	..	.....
S. M.	35	3/10/14	..	♂	Latent	+	+	+	+	..	..	Diabetes
D.	36	3/10/14	..	♂	Latent	+	+	+	+	..	..	.....
D.	37	3/10/14	..	♂	Ulcers on legs	+	—	+++	+	..	..	Retinitis
N. R.	38	3/10/14	40	♂	.....	+	—	+++	+	..	..	.....
M. R.	39	3/ 2/14	42	♂	Tertiary	+	+	+++	+	..	..	.....
B. F.	40	3/ 2/14	36	♂	Latent	+	+	+++	+	..	..	.....
C.	41	3/ 2/14	..	♂	.....	—	—	—	—	..	..	Infiltration of skin about the nose
C.	42	3/ 2/14	32	♂	.....	—	—	—	—	..	..	.....
Ch. H.	43	3/12/14	50	♂	Cerebral syphilis	+	+	+++	+	..	..	Epithelioma of tongue
A. N.	44	3/16/14	32	♂	.....	+	+	+++	+	..	..	.....
E. J.	45	3/16/14	21	♂	Secondary	+	+	+++	+	..	..	.....
A. H.	46	3/16/14	48	♂	Tabes	+	+	+++	+	..	..	Pain in arms and legs
A. J.	47	3/18/14	29	♂	.....	—	?	+++	+	..	..	Senile dementia
M. G.	48	3/18/14	56	♂	.....	+	+	+++	+	..	..	.....
D.	49	3/19/14	28	♂	Tabes	+	+	+++	+	..	..	.....
S.	50	3/19/14	55	♂	Syph. neuritis	+	+	+++	+	..	..	Mixed infection
C. M.	51	3/20/14	19	♂	.....	+	+	+++	+	..	..	Tuberculosis
D.	52	3/21/14	43	♂	.....	+	+	+++	+	..	..	Visceral ptosis
S. L.	53	3/21/14	29	♂	.....	+	+	+++	+	..	..	.....
S. M.	54	3/23/14	32	♂	Primary	+	+	+++	+	..	..	Sore throat
F. O.	55	3/23/14	23	♂	.....	+	+	+++	+	..	..	.....
Ch. B.	56	3/23/14	26	♂	Primary and second	+	+	+++	+	..	..	.....
A. H.	57	3/23/14	29	♂	Latent	+	+	+++	+	..	..	Stomach disturbances and falling of hair
R.	58	3/24/14	..	♂	.....	—	?	+++	+	..	..	.....
H. W.	59	3/25/14	27	♂	Secondary	+	+	+++	+	..	..	Ulcers of legs
S. F.	60	3/25/14	19	♂	.....	+	+	+++	+	..	..	.....
S. C.	61	3/25/14	29	♂	Cerebral lues	+	+	+++	+	..	..	.....
I. C.	62	3/25/14	31	♂	Primary and secondary	+	+	+++	+	..	..	.....
J. F.	63	3/25/14	25	♂	Secondary	+	+	+++	+	..	..	Periostitis on r. olecranon
J. H.	64	3/25/14	43	♂	.....	+	+	+++	+	..	..	.....
A.	65	3/25/14	38	♂	Tertiary	+	+	+++	+	..	..	Arthritis
K.	66	3/25/14	29	♂	Primary	+	+	+++	+	..	..	.....
H. P.	67	3/25/14	..	♂	.....	—	?	+++	+	..	..	Exostosis on r. tibia. Head-aches
W. K.	68	3/25/14	19	♂	Secondary	+	+	+++	+	..	..	.....
G. G.	69	3/27/14	52	♂	.....	+	+	+++	+	..	..	.....
S. Ch.	70	3/27/14	29	♂	Cerebral lues	+	+	+++	+	..	..	Black-water fever
N. A.	71	3/30/14	26	♂	Syph. anemia	+	+	+++	+	..	..	.....
P. OC.	72	3/30/14	42	♂	.....	—	—	+++	+	..	..	Pain in r. arm and leg
N.	73	3/30/14	28	♂	Secondary	+	+	+++	+	..	..	Frozen foot, refused to heal
R.	74	3/31/14	35	♂	.....	—	—	+++	+	..	..	.....
J. K.	75	4/ 1/14	33	♂	.....	—	—	+++	+	..	..	Coryza
A. B.	76	4/ 1/14	32	♂	.....	—	—	+++	+	..	..	Pain in left shoulder
S. C.	77	4/ 1/14	38	♂	.....	—	—	+++	+	..	..	Epileptic
J. C.	78	4/ 3/14	36	♂	.....	+	+	+++	+	..	..	.....
J. McG.	79	4/ 3/14	50	♂	Tertiary	+	+	+++	+	..	..	Gonorrhea
N. C.	80	4/ 3/14	50	♂	Secondary	+	+	+++	+	..	..	.....
181	81	4/ 6/14	..	♂	.....	—	—	+++	+	..	..	.....
J. L.	82	4/ 6/14	32	♂	.....	—	—	+++	+	..	..	.....
J. M. C.	83	4/ 7/14	24	♂	.....	—	—	+++	+	..	..	.....
C. R.	84	4/ 7/14	28	♂	.....	—	—	+++	+	..	..	.....
Sch.	85	4/ 8/14	32	♂	.....	—	—	+++	+	..	..	.....
Ch. L.	86	4/ 8/14	33	♂	.....	—	—	+++	+	..	..	.....
W. O.	87	4/ 8/14	21	♂	.....	—	—	+++	+	..	..	.....
J. F.	88	4/ 8/14	35	♂	.....	—	—	+++	+	..	..	.....
G. Cl.	89	4/ 9/14	25	♂	Secondary	+	+	+++	+	..	..	.....
493	90	4/10/14	..	♂	.....	—	—	+++	+	..	..	.....
W. N.	91	4/13/14	23	♂	Secondary	+	+	+++	+	..	..	.....
W. Sch.	92	4/13/14	24	♂	Latent	+	+	+++	+	..	..	.....
C. P.	93	4/14/14	36	♂	Cerebral lues	+	+	+++	+	..	..	.....
H. T.	94	4/14/14	..	♂	.....	—	—	+++	+	..	..	.....
S. F.	95	4/15/14	..	♂	.....	—	—	+++	+	..	..	.....
H.	96	4/16/14	..	♂	.....	—	—	+++	+	..	..	.....
S. J.	97	4/16/14	..	♂	.....	—	—	+++	+	..	..	.....
S.	98	4/17/14	..	♂	.....	—	—	+++	+	..	..	.....
M. R.	99	4/17/14	..	♂	.....	—	—	+++	+	..	..	.....
A.	100	4/17/14	..	♂	.....	—	—	+++	+	..	..	.....

TABLE 1.—DIAGNOSIS AND SEROLOGIC FINDINGS IN 200 CASES—(Continued)

Name	Case	Date	Age	Sex	Stage of Syphilis	History	Treatment	Wassermann Reaction	Sero-enzyme Test			Other Diseases and Complaints
									Syph.	Tuberc.	Goiter	
M. M.	101	4/20/14	24	♀	.....	—	—	++	+	..	..	Lupus vulgaris?
F. K.	102	4/20/14	48	♂	.....	—	—	++	+	..	..	Frontal and parietal headaches
I. H.	103	4/21/14	46	♂	.....	—	?	++	±	..	..	Total blindness
Sch.	104	4/21/14	..	♂	.....	—	?	++	±	..	..	Necrosis of toes
O. P.	105	4/21/14	62	♂	Tabes	+	+	++	+	..	..	Aphasia on left side of face, occ. pain
D.	106	4/21/14	46	♂	.....	—	—	++	+	..	..	.....
A. C.	107	4/21/14	16	♂	Tabes	..	—	+++	+	..	..	Pulm. tuberculosis
F. G.	108	4/21/14	?	♂	.....	—	—	++	+	..	..	Pain in back
M. F.	109	4/21/14	..	♂	.....	+	+	+++	+	..	..	Epileptic
M. L.	110	4/22/14	38	♂	.....	—	—	++	±	..	..	Dizziness
McP.	111	4/22/14	29	♂	.....	—	—	++	±	..	..	.....
W. M.	112	4/22/14	53	♂	Tertiary	+	+	+++	+	..	..	Blindness in rt. eye
P. C.	113	4/22/14	36	♂	.....	+	+	+++	+	..	..	.....
P. Sch.	114	4/22/14	62	♂	Tabes	+	+	+++	+	..	..	Mitral and aortic regurgitation
	115	4/23/14	40	♂	.....	—	—	++	+	..	..	Goiter
C. B.	116	4/24/14	22	♂	.....	—	—	—	—	..	+	Wart-like growth under right thumb, 7 years
H.	117	4/24/14	24	♂	.....	—	—	+	—	..	..	Tuberculosis pulm.
J. J.	118	4/29/14	34	♂	.....	—	—	—	—	+	..	.....
S. J.	119	4/29/14	24	♂	Secondary	+	+	—	—	+	..	.....
H. V.	120	4/29/14	27	♂	Rec. primary?	+	+	—	—	+	..	.....
D. J.	121	4/29/14	35	♂	.....	—	—	—	—	—	..	Saddle nose
G. L.	122	4/29/14	40	♂	Tabes	—	?	—	+	+	..	.....
H. T.	123	4/30/14	47	♂	Tabes	+	+	+++	+	—	..	Burn sec. degree
J. M.	124	4/30/14	..	♂	.....	—	—	—	—	—	..	Acne, Tuberc. pulm.
A. G.	125	4/30/14	18	♂	.....	—	—	+	—	+	..	.....
C.	126	4/30/14	3	♂	Congenital?	—	—	—	—	—	..	Tuberc. pulm.
W. L.	127	5/ 1/14	35	♂	Latent	+	+	—	+	+	..	Goiter
Ch.	128	5/ 1/14	57	♂	.....	—	—	+	—	+	+	.....
L. B.	129	5/ 1/14	25	♂	.....	—	—	—	—	—	+	.....
G. M.	130	5/ 1/14	30	♂	Malignant secondary	+	+	+++	—	+	..	.....
A. J.	131	5/ 1/14	19	♂	Latent	+	+	—	—	+	..	.....
G. S.	132	5/ 2/14	25	♂	Primary 5 weeks	+	+	—	—	+	..	Tuberc. periost. tibia, dextra
J. B.	133	5/ 2/14	8	♂	.....	—	—	—	—	+	..	Tuberc. right knee
O.	134	5/ 2/14	28	♂	.....	—	—	+	—	+	..	Tuberc. pulm.
S.	135	5/ 2/14	25	♂	.....	—	—	—	—	+	..	Tuberc. pulm.
G.	136	5/ 2/14	35	♂	.....	—	—	++	+	+	..	Tuberc. pulm.
L.	137	5/ 2/14	21	♂	.....	—	—	—	—	+	..	Tuberc. pulm.
L. B.	138	5/ 2/14	..	♂	.....	—	—	—	—	+	..	Tuberc. pulm.
A. W.	139	5/ 2/14	..	♂	.....	—	—	—	—	+	..	Tuberc. pulm.
J. H.	140	5/ 2/14	..	♂	.....	—	—	++	+	+	..	Tuberc. pulm.
M. L.	141	5/ 4/14	30	♂	.....	—	?	++	±	+	..	Gonorrheal arthritis
W. W.	142	5/ 4/14	21	♂	.....	—	—	++	±	+	..	Ulcerative cond. of toes.
D. I.	143	5/ 4/14	20	♂	.....	—	—	++	±	+	..	Gonorrhea
A. B.	144	5/ 4/14	31	♂	.....	+	?	++	±	+	..	.....
J. F.	145	5/ 4/14	20	♂	Latent	—	—	—	—	+	+	Headache
M.	146	5/ 5/14	25	♂	.....	—	—	—	—	+	+	Pregnant
L.	147	5/ 5/14	35	♂	.....	+	+	++	+	±	..	Pain in right shoulder
H. S.	148	5/ 5/14	56	♂	Latent	—	—	—	—	+	..	Tuberc. pulm.
A. S.	149	5/ 5/14	..	♂	.....	—	—	—	—	+	..	Tuberc. pulm.
L.	150	5/ 5/14	..	♂	.....	—	—	—	—	+	..	Tuberc. pulm.
P.	151	5/ 5/14	..	♂	.....	—	—	+	—	+	..	Macroglossia
G.	152	5/ 6/14	27	♂	.....	+	+	+++	+	+	..	Run down
McG.	153	5/ 6/14	22	♂	Secondary	+	+	—	—	+	..	.....
F. M.	154	5/ 8/14	28	♂	Primary	+	—	—	—	+	..	Ulcer on forehead
L. D.	155	5/ 8/14	22	♂	Sec. palmar syph.	+	—	—	—	+	..	Normal
G. L.	156	5/ 8/14	42	♂	.....	—	—	++	+	+	..	Ulcer Toe
M.	157	5/ 9/14	29	♂	.....	—	—	—	—	+	..	Asthma
W. H.	158	5/11/14	21	♂	.....	—	—	—	—	+	..	Cancer of throat
A. A.	159	5/11/14	..	♂	.....	+	+	+++	+	—	..	.....
A. M.	160	5/13/14	50	♂	.....	—	—	++	+	—	..	.....
A. S.	161	5/14/14	43	♂	Secondary	+	+	++	+	—	..	Pain in r. elbow and wrist
A. T.	162	5/15/14	30	♂	Latent	+	+	+	+	±	..	Ulceration of nose and throat
30	163	5/15/14	35	♂	.....	—	—	+	—	±	..	Cold
32	164	5/17/14	35	♂	.....	—	—	+++	+	+	..	Warts on wrist and arms
	165	5/17/14	38	♂	.....	—	—	—	—	+	..	Normal
L. C.	166	5/17/14	20	♂	.....	—	—	—	—	—	..	Run down
33	167	5/17/14	..	♂	.....	—	—	—	—	—	..	Stomatitis
34	168	5/17/14	..	♂	.....	—	—	—	—	—	..	.....
R. R.	169	5/19/14	40	♂	.....	—	—	—	—	+	..	.....
H. W.	170	5/19/14	..	♂	.....	—	—	—	—	+	..	.....
W. H.	171	5/19/14	..	♂	Latent	+	?	+++	+	+	..	.....
F. D.	172	5/19/14	21	♂	Primary	+	+	—	+	±	..	.....
P. H.	173	5/20/14	24	♂	Latent	+	+	—	+	±	..	.....
P. McG.	174	5/21/14	34	♂	Latent	+	+	++	+	+	..	.....
K.	175	5/21/14	..	♂	.....	—	—	—	—	+	..	Facial paralysis
E. S.	176	5/21/14	37	♂	.....	—	—	+	—	+	..	Tuberc. of kidney?
M. S.	177	5/22/14	27	♂	.....	—	—	—	—	+	+	Goiter
P. W.	178	5/22/14	25	♂	.....	—	—	++	+	..	..	Gonorrhea
W. McG.	179	5/22/14	58	♂	Primary	+	+	+	+	+	..	.....
H. B.	180	5/22/14	48	♂	.....	—	—	—	—	+	..	Rheumatism
G. M.	181	5/22/14	43	♂	.....	—	—	—	—	+	..	Pleurisy
P. J.	182	5/22/14	43	♂	.....	—	—	—	—	+	..	Stomach trouble
G. McD.	183	5/25/14	37	♂	.....	—	—	+	—	+	..	176
R.	184	5/21/14	..	♂	Primary	..	—	—	—	+	..	Injury to head by blow
J. M.	185	5/25/14	43	♂	.....	—	—	—	—	+	..	.....
B. U.	186	5/25/14	25	♂	Secondary	+	+	++	+	+	..	Hemoptysis
J. W.	187	5/25/14	56	♂	.....	—	—	—	—	+	..	Tuberc. pulm.
P. L.	188	5/25/14	30	♂	.....	—	—	—	—	+	..	Pain in legs and arms
McD.	189	5/25/14	55	♂	.....	—	?	+	—	+	..	Gonorrhea
B. C.	190	5/26/14	27	♂	.....	—	—	—	—	+	..	Gonorrhea
J. A.	191	5/26/14	29	♂	.....	+	+	+++	+	+	..	.....
Ch.	192	5/26/14	34	♂	Latent	+	+	—	—	+	..	.....
	193	5/26/14	30	♂	Secondary	+	+	+	+	+	..	.....
	194	5/26/14	26	♂	.....	—	—	—	—	+	..	Ulcer on r. tonsil
	195	5/26/14	..	♂	Primary	—	—	—	—	+	..	.....
	196	5/27/14	19	♂	.....	—	—	++	+	+	..	Epileptic
	197	5/27/14	34	♂	Secondary	—	+	—	—	+	..	.....
	198	5/27/14	29	♂	Paresis	—	+	++	—	+	..	.....
	199	5/27/14	33	♂	Secondary	+	+	+	+	+	..	.....
	200	6/ 1/14	54	♂	.....	—	—	—	—	+	..	Multiple sclerosis epileptic

* Spinal fluid. † The husband of this patient was syphilitic. ‡ Placenta. § Thyroid.

TABLE 2.—SEROLOGIC FINDINGS IN 85 CASES WITH HISTORY OF SPECIFIC INFECTION*

Primary:	1	3	10	11	16	17	18	24
	++	0+	0+	++	++	++	++	00
	32	54	120	132	155	172	179	
	++	±+	00	++	00	0+	0+	
Secondary:	7	15	21	45	56	59	62	63
	++	++	++	++	++	++	++	++
	68	80	89	90	91	97	99	100
	++	++	++	00	++	00	++	++
	119	130	153	162	186	193	199	
	0+	+0	++	++	++	+0	++	
Tertiary:	12	28	40	50	64	65	69	75
	++	++	++	++	0+	++	00	++
	112	159						
	++	++						
Latent:	2	8	13	14	23	26	30	35
	++	++	±±	++	++	++	++	++
	37	41	57	92	98	127	131	144
	++	++	++	++	++	0+	00	++
	147	163	171	173	174	192		
	++	++	++	0+	++	++		
Cerebral Lues:	4	33	43	61	70	93		
	++	++	++	++	+0	++		
					Sp. f.			
Tabes:	46	49	94	105	107	109	114	123
	++	++	++	++	++	++	++	++
							Sp. f.	Sp. f.
Congenital syphilis:	95							
	++							

* The designation to the left indicates the findings with the Wassermann reaction; to the right the result of the sero-enzyme test.

Table 3 gives the arrangement of these eighty-five cases according to the serologic findings.

TABLE 3.—ARRANGEMENT OF 85 CASES WITH HISTORY OF SPECIFIC INFECTION ACCORDING TO THE SEROLOGIC FINDINGS*

No. of Cases	Percentage	Wassermann Reaction	Sero-Enzyme Test
62	72.94	+	+
5	5.88	+	+
7	8.23	—	—
8	9.41	—	±
1	1.16	±	±
2	2.32	—	±

* In this table + = positive; — negative; ± doubtful.

Out of the 5 cases which gave a positive Wassermann reaction and a negative sero-enzyme for syphilis, 3 were cerebrospinal fluid which does not contain enzymes—Cases 70, 114, 123. The 7 cases giving a negative Wassermann reaction and a positive sero-enzyme syphilis reaction were, 3 in the primary, 1 in the secondary, 1 in the tertiary and 2 in the latent stages of syphilis. Case 54, primary chancre, gave a doubtful Wassermann reaction and a positive sero-enzyme. Cases 13 and 172, also primary chancre, gave a negative Wassermann reaction and a doubtful sero-enzyme reaction for syphilis.

TABLE 4.—ARRANGEMENT ACCORDING TO SEROLOGIC FINDINGS OF 115 CASES IN WHICH THE SPECIFIC HISTORY WAS NEGATIVE

Number	Percentage	Wassermann Reaction	Sero-Enzyme for Syphilis
54	26.95	+	+
23	20.00	+	+
13	11.3	—	—
44	38.26	+	±
4	3.47	+	±

Out of the 115 cases giving no history of specific infection 24 presented clinical symptoms of the disease.

In summarizing the findings of Table 5 we find the Wassermann reaction positive and sero-enzyme reaction positive in 12 cases or 50 per cent.; Wassermann

reaction positive and sero-enzyme reaction negative in 3 cases or 12.5 per cent.; Wassermann reaction negative and sero-enzyme reaction positive in 8 cases or 33.33 per cent.; Wassermann reaction negative and sero-enzyme reaction negative in 1 case or 4.16 per cent.

TABLE 5.—CASES IN WHICH SPECIFIC INFECTION WAS DENIED, DIAGNOSED CLINICALLY AS SYPHILIS

1	Alopecia areata, gastric disturb.	58	+++	+
2	Alopecia areata	86	++	+
3	Aphasia, l. side of face	106	++	+
4	Blindness in right eye, Sp. fluid	113	+++	—
5	Cerebral lues	20	++	+
6	Gumma of testes	5	+++	+
7	Latent, husband known to be syph.	19	—	+
8	Latent, child syphilitic	25	—	+
9	Macroglossia	152	++	+
10	Necrosis of toes	104	++	+
11	Palmar syphilitic	156	++	+
12	Paresis Sp. fluid	198	+++	—
13	Primary lesion	66	—	+
14	Primary lesion	184	—	+
15	Primary lesion	195	—	+
16	Retinitis	39	+++	+
17	Secondary syphilis	73	++	+
18	Secondary syphilis	101	++	+
19	Secondary syphilis	197	—	+
20	Syphilitic ulcers on legs	38	—	+
21	Syphilitic ulcers on legs	60	+++	+
22	Syphilitic ulcers in nose and throat	165	+++	+
23	Syphilitic ulcers on right tonsil	194	—	+
24	Tabes	122	—	+

The 3 cases giving a positive Wassermann reaction and a negative sero-enzyme syphilis reaction include 2 cases, that is, Cases 4 and 12, in which spinal fluid was tested. The cerebrospinal fluid does not contain the protective enzymes. The 8 cases giving a negative Wassermann reaction and a positive sero-enzyme syphilis reaction were: 2 cases of primary syphilis (Cases 66 and 195), 1 secondary (Case 197), 2 latent (Cases 19 and 25), 2 had syphilitic ulcers (Cases 38 and 194), and 1 case of tabes (Case 122). Aside from the 12 cases found to be positive to the Wassermann reaction and sero-enzyme test for syphilis in the series clinically syphilitic, 19 others were found among the remaining 91 whose serums reacted positive in both tests, or 16.52 per cent.

TABLE 6.—WASSERMANN REACTION AND SERO-ENZYME TEST POSITIVE IN CASES IN WHICH SPECIFIC INFECTION WAS DENIED

	No.	Case
1	1	71
2	1	141
3	3	78, 196, 200
4	1	44
5	3	87, 143, 178
6	2	6, 102
7	1	115
8	1	77
9	1	96
10	1	27
11	1	9
12	2	52, 136
13	1	9
	1	53
	19	

WASSERMANN REACTION POSITIVE, SERO-ENZYME DOUBTFUL

1	Blindness (total)	1	103
2	Coryza	1	76
3	Dizziness	1	111
4	Ulcerative condition of the toes	1	142
		4	

Of the 4 cases giving a positive Wassermann and a doubtful sero-enzyme reaction, Case 142 gave a single positive Wassermann while the remaining 3 gave double positive results. These latter 3 patients

may be suffering from specific infection although no clue to it could be elicited in their history.

The Wassermann reaction was positive and the sero-enzyme test for syphilis negative in 20 out of 115 cases, or 17.39 per cent. It is interesting to note that 9 cases of tuberculous condition, in Table 7 gave a positive Wassermann reaction which, though faint, was distinct. Tuberculosis is capable of giving a positive Wassermann reaction. If we subtract the 9 cases of tuberculosis in Table 7 and Case 161, cancer of the throat, we have left 10 cases which possibly might be syphilitic.

TABLE 7.—WASSERMANN REACTION POSITIVE, SERO-ENZYME TEST NEGATIVE

		Case	No.
1	Asthma	1	160
2	Cancer of throat	1	161
3	Gonorrhea	1	190
4	Gonorrhea	1	180
5	Lupus vulgaris	1	22
6	Pain in arms and legs, elbows, wrists	3	74, 164, 189
7	Pain in left shoulder	1	148
8	Senile dementia	1	48
9	Tuberculosis	9	125, 128, 134, 138, 139, 140, 151, 176, 183
10	Wart under thumb-nail	1	117
		20	

Six serums of patients suffering from the conditions indicated in Table 8 gave a negative Wassermann reaction and a positive sero-enzyme test.

TABLE 8.—WASSERMANN REACTION NEGATIVE, SERO-ENZYME TEST POSITIVE

		Case	No.
1	Facial paralysis	1	175
2	Frozen foot refusing to heal	1	75
3	Gonorrhea	1	191
4	Mixed Infection (Gon.)	1	51
5	Run-down condition	1	169
6	Arthritis	1	67

Out of the remaining 42 cases, 36, or 39 per cent., were both negative for Wassermann reaction and the sero-enzyme test for syphilis. The clinical condition of these cases is given in Table 9.

TABLE 9.—SPECIFIC INFECTION DENIED. WASSERMANN REACTION AND SERO-ENZYME TEST NEGATIVE

	Case	No.
Acne rosacea	1	42
Black-water fever	1	72
Burn Sec. Degree	1	124
Chaneroid	1	31
Coryza	1	166
Diabetes	1	36
Epilepsy	2	34, 120
Exostosis on head	1	84
Gonorrhea	1	81
Goiter	3	116, 129, 177
Headache	2	29, 145
Injury to head	1	185
Normal	3	126, 158, 168
Ozena, erosion of nose	1	83
Pain in arm and legs	1	47
Pregnancy	1	146
Pleurisy	1	181
Run down condition	1	154
Saddle Nose	1	121
Sore throat	1	55
Siccatitis	1	170
Stomach trouble	1	182
Tuberculosis	11	85, 88, 108, 118, 133, 135, 137, 149, 150, 187, 188
Ulcers on 1. arm and fingers	1	82
Ulcer on forehead (Epithelioma?)	1	157
Warts on arm and hands	1	167

SUMMARY

1. In conclusion I would point out that in the sero-enzyme test for syphilis, when carried out with syphilitic testicular tissue, is probably a specific reaction, since the somatic cells are highly specialized, presupposing a specific enzyme for their cleavage. Thus, in the use of the gumma produced in rabbits by inoculation, we make use of a substratum which, when free from contamination, is superior to tissue prepared from the tissue of syphilitic patients, which of necessity is contaminated and is likely to give rise to positive reaction in other conditions.

2. The reaction is not applicable in cases in which cerebrospinal fluid is to be tested.

3. The reaction is more specific than the Wassermann reaction, for it has always given a positive reaction with the serum of tabetics, while the Wassermann reaction in this condition is negative in about 40 per cent. of cases. I would also point out the nine cases of tuberculosis which gave a positive Wassermann reaction although no sign of syphilis could be found in any of these patients. The specificity of the test is further shown in the 8 cases giving a negative Wassermann reaction and a positive sero-enzyme test (Summary of Table 5).

4. The technic of the reaction demands cleanliness and careful control of shells, tissue, serum and the carrying out of the ninhydrin reaction. As one becomes acquainted with the test one's confidence in it increases.

5. The sero-enzyme test for syphilis represents, with the exceptions indicated, a true biologic test for this disease.

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THE INTRAVENOUS ADMINISTRATION OF
MERCURY IN SYPHILIS *

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This method was first used by Bacelli in 1893, and subsequently by Blaschko, Lewin, Chopping, Lane, Abadie, Campana, and Stoukownenkoff and others. The method in recent years has apparently fallen into disuse, very few articles on the subject being found in the literature. This may be due to the rather discouraging attitude of Fournier, who looked on the method with disfavor. He is under the impression that a toxic agent, such as mercury, suddenly placed in contact with the endometrium, may possibly exert a deleterious effect on it. His supposition is based on the experiments of Ullman. While Ullman has never seen an animal die after the intravenous injection of large doses of mercury, yet in a few cases in which death occurred later, there were no lesions which would account for the death of the animal, and Fournier reasons that death might have been caused by paralysis of the heart, engendered by the previous injections of mercury. Two comparatively recent articles on the intravenous injection of mercury in the treatment of syphilis are by Meyer, whose results were disappointing.

* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

and Lydston, whose results in eight cases were very gratifying. Wernick appears enthusiastic, after twelve years of experience with the intravenous injection of mercury. Balzer, at the French Medical Congress of 1904, endorsed it for cerebral and ocular syphilis. Ravant uses the cyanid of mercury, intravenously, as a preliminary to salvarsan therapy.

Our experience with this method is derived from its use at the New York Skin and Cancer Hospital, in a large number of cases of cutaneous syphilis. We first used the bichlorid in doses of $\frac{1}{6}$ to $\frac{1}{3}$ grain in distilled water. On an average, six injections were given in each case. Our best results were attained with this salt. We also used the benzoate in a 1 per cent. solution in normal saline, of which the dose was from 2 to 12 c.c. While the results with this salt were good, they were inferior to those obtained with the bichlorid. Enesol¹ in our hands proved very unsatisfactory, and a proprietary preparation of mercuric oxycyanid also gave inferior results.

The technic of the injection is simple, provided that the subject has prominent veins, otherwise the percentage of failure to get the needle in the lumen of the vein is in proportion to the experience of the operator in intravenous work. The most prominent vein at the bend of the elbow of either arm is selected, the region sterilized with alcohol, and a constricting band, preferably a piece of rubber tubing, applied to the lower third of the arm. The patient closes the fist tightly so as to increase the tension in the veins. The filled glass syringe with needle attached, is inserted in a vertical direction through the skin, and then directed obliquely into the vein. The direct flow of blood into the barrel of the syringe is sufficient indication that the needle is within the lumen of the vein. The constricting band is removed, and the mercurial solution with the admixed blood is slowly injected. The amount of solution used varies of course with the particular dose which we wish to give, but it rarely exceeds 12 c.c.

The advantages of the intravenous method are: immediate introduction of the curative agent in the circulating blood, rapid therapeutic results, mathematical dosage and absence of pain. The most important disadvantage is the occasional occurrence of phlebitis, and periphlebitis, which seemed more frequent after the use of the bichlorid than of the benzoate; this complication, however, occurred only in our early cases, when the solution used was more concentrated. A small number of the patients suffered from ptialism and a few others developed mercurial diarrhea, but, in none of the cases did these complications cause anything more than a temporary disturbance.

The results in our hands in cases where the rapid removal of lesions was desired were uniformly good. Among the cases we recall was one with an extensive palmar lesion of the right hand of ten years' duration; it entirely disappeared after two injections of 4 and 7 c.c., respectively, of a 0.5 per cent. solution of benzoate of mercury. Another case with two large serpiginous, greatly infiltrated, and crusted lesions, several inches in diameter, on the left hand and wrist, cleared up entirely after the third injection. Still another lesion involving half the palm of the left hand, which had resisted mixed treatment for four months, cleared up entirely after the third injection. A

gumma of the right thigh disappeared entirely after three injections. An extensive secondary eruption of the pustular type resolved after four injections, leaving scales of dried pus, which were easily removed, disclosing an entirely healed lesion beneath. An extensive raised, grouped, papular lesion of the left cheek was rapidly resolving, and had lost all of its infiltration; the lesions were even with the skin after three injections. An ulcerated, serpiginous lesion, 4 inches long by 1 inch broad, and greatly crusted, healed entirely after two injections.

These are a few of the many cases which impressed us with the rapid therapeutic results obtained with this method, and we are strongly convinced that despite its obvious disadvantages it is of great value in selected cases. It is not to be used indiscriminately, however, and we do not recommend it for routine administration.

ABSTRACT OF DISCUSSION

ON PAPERS OF MRS. WHITE, HAZEN, NICHOLS, BAESLACK, FORDYCE, CORBUS, AND KINGSBURY AND BECHET

DR. WILLIAM T. CORLETT, Cleveland: Dr. White emphasized the fact that patients themselves are often responsible for much of the misery and many of the late lesions that follow in the course of syphilis. His statistics show that in a large percentage of cases, patients come to the hospital for treatment for only a few days. In our experience at the Lakeside Hospital, in a large percentage of cases, patients were treated for only three days, a still larger percentage for two or three weeks, etc. This confirms the experience of Dr. White and shows that the patients themselves do not realize the importance of their disease or the value of thorough treatment from the beginning. We have endeavored to educate such patients by distributing a printed circular setting forth some of the possible dangers of the disease, if left untreated, and also emphasizing the precautions that they should take to guard against infecting others, and the probable length of time that it will be necessary to follow out a systematic course of treatment. Furthermore, even physicians are not alive to the importance of treatment during the primary stage of the infection. We have endeavored, especially, to give heroic treatment in appropriate cases at the outset of the disease, and while it is extremely difficult to speak with assurance on this point, we believe that in a few instances we were successful in curing the disease in this way, as a few patients have been kept under careful observation for at least two years without showing further manifestations of syphilis. I believe that 99 per cent. of the physicians in this country are incapable of treating the disease according to the advocated standard, and that the root of the trouble lies with the medical schools and hospitals. The haphazard way in which the delicate technic advocated by Dr. Fordyce and required in intraspinal treatment, is carried out in many hospitals where the work is often left to young inexperienced interns and without intelligent supervision, is appalling. In the light of this symposium more than ever do I believe that the hospital treatment and medical-school teaching of syphilis, in all its phases, should be under the guidance of one particular man with the cooperation of the other members of the staff.

DR. S. POLLITZER, New York: In a paper read before the New York County Medical Society in January, 1911, I developed the theory that the spirochetes soon after infection were distributed throughout the entire system, involving every organ and tissue reached by the blood-stream. There most of them were probably destroyed by the natural forces of resistance, but many doubtless passed over into a resting or spore stage in which they remained indefinitely without harm to their host till under some local stimulus, such as a trauma, they renewed their activity and produced the lesions of tertiary syphilis. This theory seems to me a necessary

1. See Enesol, an Arsenic and Mercury Preparation of Uncertain Composition, Propaganda Department, THE JOURNAL A. M. A., July 26, 1913, p. 292.

conclusion from the known facts of biology and the clinical course of syphilis. To obviate the late lesions of the disease every case should be treated at its very inception by the most intense medication at our command. The question of the best method of treating tabes and paresis is by no means settled. Treatment by intraspinal methods is still in an experimental stage and the present state of our knowledge of these methods does not justify their general adoption. The working out of the details should be left to those who are qualified by their larger opportunities to carry them out. The intraspinal methods give promise of usefulness; but we must realize that no possible treatment can restore nerve fibers and cells that have been destroyed. I employ the Ravaut method, direct injection of hypertonic solutions of neosalvarsan, and while I have had some very unpleasant immediate symptoms, I have had no permanently bad results from it. Meanwhile it is well to remember that these forms of syphilis are immensely benefited by energetic treatment by other methods. For the past two years I have had a patient with paresis under observation whom I took out of the psychopathic ward at Bellevue Hospital and gave sixteen injections of salvarsan, in all 10 gm., in sixty days. That man is to-day apparently well; his blood-Wassermann is negative, his spinal fluid contains three cells to the cubic millimeter, globulin negative, Wasserman negative with all but the maximum quantity of fluid. I shall report on the final outcome of this case in ten years. It is unfortunate that the treatment of syphilis in its early stage is almost exclusively in the hands of the general practitioner, who so often contents himself with prescribing some pills and loses sight of the patient with the disappearance of the first symptoms. It is unfortunate that he does not realize his opportunity and his responsibilities. There is reason to believe that, in its earliest stage, syphilis can be cured by excision of the chancre and a single energetic course of salvarsan and mercury. It is equally true that the specialists for the eye and throat treat their cases of syphilis badly, that is, symptomatically. They also stand in need of education on this subject.

DR. C. AUGUSTUS SIMPSON, Washington, D. C.: The percentage of syphilis among the negroes of Washington is very high, as they rarely persist in the prescribed treatment. I think that the number of cases among the white population is not so great as in some other sections of the country, and that the amount of syphilis among the white patients that visit Freedmen's Hospital of our city is no indication of the number of cases there, as very few white patients can be treated in a negro hospital and the class that does apply for treatment is, as a rule, the very class in which one would expect to find a large number of syphilitics. The frequency of syphilis of the nervous system in the future will depend a good deal on the thoroughness and conscientiousness with which the medical man carries out his treatment and blood-tests. If he cannot distinguish between a negative provocative Wassermann and a negative plain Wassermann he will soon get into trouble. The latter means little or nothing so far as a cure is concerned. An effort should be made to get a negative luetin reaction, while a negative provocative test should be insisted on before the patient is allowed to stop his treatment.

DR. A. RAVOGLI, Cincinnati: The syphilitic patient usually gets what he deserves. Patients who refuse to undergo proper treatment for the prescribed length of time and who drink alcoholics and neglect themselves are very apt to suffer in the future. There is no doubt that syphilis is very common among the negroes, and in my hospital work it is exceptional to find an adult negro who is free from the disease or does not give a history of a past infection, while among the negro children, evidences of hereditary syphilis are very frequently observed. In the colored race, syphilis is probably more severe than in the white, and this I am rather inclined to attribute to the nonchalance with which the former usually regards his infection. He looks on the disease with apparent unconcern, and usually cannot be restrained in the hospital for more than a few days. There

is no question that we have obtained very good results in the mercurial treatment of syphilis in the past. Some time ago I was asked by a French writer how many of my syphilitic patients had developed tabes or general paresis, and on reviewing my books, I found very few. In many of my cases, intramuscular injections of a 1 per cent. solution of mercuric chlorid, and later, gray (mercurial) oil and calomel, gave very satisfactory results, and now, of course, in salvarsan, we have another powerful weapon. The use of intravenous injections of mercuric oxycyanid, as recommended by my teacher, Professor Baccelli, and used by Ernest Lane of London, apparently gave no better results than those I have obtained by the older methods of intramuscular injections and I think the intramuscular injections are preferable to the intravenous. This does not apply, however, to salvarsan, which gives its best results when injected into the veins, and does not produce so severe pains as it does when injected into the muscular masses. I have never used the intradural injections, and I was much interested in the results obtained by this method.

DR. THOMAS W. MURRELL, Richmond, Va.: Every southern man feels a vital interest in syphilis in the negro which is more important to him than leprosy, and this condition has been practically forced on the negro by the national government. Before the Civil War, the negro was a commercial problem. His physical as well as his moral condition was well looked after, as is shown by his conduct up to that time. Then he was turned loose, his naturally strong sexual instincts were no longer held in control, he began to drink to excess, to eat poor food, to live in a hovel, to be insufficiently clothed, and gradually he went from bad to worse until now the death rate among the negro is higher than that of the white race, while the birth rate, in spite of the well known procreative power of the black race, has steadily grown smaller. Syphilis is very common among them and insanity in the State of Virginia has increased 1,000 per cent. since 1865. Its increase, in fact, is one of the problems of the state. In our dispensary work in Richmond we make the Wassermann test in negroes as a routine measure, and it is almost invariably positive. Of all the specimens of blood taken, probably 75 per cent. show a positive Wassermann. We can sometimes reason out things, even if we are not laboratory men, and I believe that some of us have a mistaken idea as to the relative value of salvarsan and mercury in syphilis. Salvarsan is a spirillicide, but I do not think the same can be said of mercury. In England, at one time, the accepted method of treatment was to give mercury to the point of salivation. We can keep a patient saturated with mercury, and yet we do not kill the spirochetes, and in any bacterial invasion of the body we have the formation of toxins which are produced either by the bacteria or by the body. In our efforts at treatment, we must destroy the organism, neutralize the toxins and strengthen the bodily resistance, and the action of mercury is to neutralize the syphilitic toxins and allow the bodily resistance to take care of the situation. One error that is too often made is to rely too much on drugs and leave the condition of the patient out of consideration.

DR. CLAUDE O. ABERNETHY, Raleigh, N. C.: I do not think that the intraspinal method of treating late syphilis should be generally adopted, at least in the present state of our knowledge, nor do I think it necessary. I have at present under my observation a case of progressive paralysis of the lower extremities in a patient with late syphilis who is rapidly improving under intravenous injections of salvarsan, combined with mercury and the iodids.

DR. H. H. HAZEN, Washington, D. C.: My paper was really intended as a provocative one, for we are not paying the proper attention to all of the aspects of syphilis. This malady is certainly not properly treated in the hospitals, the economic side of it has never been carefully studied, and the methods of prevention are very crude, to say the least. For instance, in my clinic we frequently see women with active secondary lesions, including mucous patches, attending to the babies of ignorant or foolish parents. This is not right

and we should have some authority to stop it. With regard to the relative frequency of syphilis among the whites and blacks, the statement that I made was that, in spite of the showing of certain localized statistics, general statistics showed that the negro suffered from syphilis one and one-half times as often as the white. At present we are having a good many Wassermanns made, but unfortunately have not as yet been able to adopt it as a routine measure. In the negro our statistics show about 30 per cent. positive, while at Johns Hopkins I understand nearly 50 per cent. in this race are positive. I am inclined to think that mercury is a spirillicide, because if one makes a dark-field examination of a lesion and finds a great number of organisms, then gives an intramuscular injection of gray oil, and again searches for the parasites, in twenty-four to forty-eight hours he will find a great reduction in their numbers.

DR. HENRY J. NICHOLS, Washington, D. C.: I see no reason why the spirochete should not remain in the body for many years as a spirochete, and the weight of evidence is rather against a spore stage. Still, there are several gaps in our knowledge of the subject and further experiments will be necessary to complete the chain of evidence.

DR. JOHN A. FORDYCE, New York: I wish to emphasize what I said with regard to the Ravaut method of intraspinal injections as compared with the Swift-Ellis method. It seems to me that the latter method is not so apt to be followed by any of the bad consequences of the Ravaut method.

D. B. C. CORBUS, Chicago: Since last fall, when I began to work along these lines, I have seen quite a number of patients with syphilis who were supposed to be cured and who gave a negative blood-Wassermann reaction, but who, on spinal puncture, showed subarachnoid involvement. I desire, therefore, again to call attention to the importance, especially in this class of cases, of an examination of the cerebrospinal fluid, the technic of which should be more generally understood and applied.

DR. PAUL E. BECHET, New York: Dr. Ravogli, in discussing the intravenous injection of mercury in syphilis, mentions pain as a prominent factor in patients treated by a confrère of his. The pain was undoubtedly caused by the invasion of the perivascular tissue, by the mercurial solution. If the needle is within the lumen of the vein, there is no leaking of the solution outside of it, and the operation is consequently absolutely painless.

THE ETIOLOGY OF PHLYCTENULAR OPHTHALMIA

IS TUBERCULOSIS REALLY AS IMPORTANT A FACTOR IN THE CAUSATION OF THIS DISEASE AS IS NOW COMMONLY TAUGHT? *

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Few questions in ophthalmology have been more discussed in recent years than the etiology of phlyctenular ophthalmia. This is accounted for by the fact that during this period the theory has been advanced, and has been supported by many eminent ophthalmologists, that phlyctenulosis is a tuberculous manifestation.

The advocates of this doctrine unceremoniously reject the older view of the etiology of this affection, which led especially German writers on diseases of the eye to designate it as ophthalmia eczematosa, and, in conformity with their convictions, urgently com-

mend in its treatment the employment of tuberculin, as the most efficacious remedial agent at our command. This being the case, it is evident that the true nature and causation of phlyctenular ophthalmia is not merely an academic question, but is one of very practical importance; for, after all, if it is really not tuberculous, the use of tuberculin in its treatment is sure to do more harm than good, and is most distinctly contra-indicated.

Let us, then, consider the evidence which has been advanced in support of the new doctrine, and try, impartially if we can, to determine its import. And here it may be premised that the advocates of the tuberculous theory no longer contend that the conjunctival or corneal phlyctenules are examples of true ocular tuberculosis, since they are compelled to admit not only that they never contain tubercle bacilli, and that tuberculosis has never been produced in animals by inoculating them with the contents of the phlyctenules, but that histologically the phlyctenules bear no resemblance whatever to true tuberculous tissue. What they do maintain is that phlyctenulosis is a pseudotuberculous or paratuberculous affection, caused by the action of the toxins of tubercle bacilli present somewhere in the body.

In support of this belief they cite:

1. The frequency—from 70 to 90 per cent., according to different investigators—with which the subjects of phlyctenulosis give a positive reaction to diagnostic tests with tuberculin, the von Pirquet test being chiefly relied on.
2. The efficacy of tuberculin in the treatment of phlyctenulosis, and especially its efficacy in controlling chronic cases and those showing a tendency to recurrence.
3. The development of phlyctenular conjunctivitis and keratitis after the application of tuberculin to the eye, and after other diagnostic tuberculin tests.
4. The occasional occurrence in phlyctenular ophthalmia of focal reaction following diagnostic or therapeutic injections of tuberculin and after the von Pirquet test.
5. The chronicity and tendency to recurrence of the disease, its predilection for the poorly nourished and for those in whom the existence of the so-called strumous or scrofulous diathesis is manifest, and the glandular complications which frequently accompany it.

Before taking up this summary of the evidence advanced in support of the tuberculosis theory, let us, for a moment, consider the significance of the admitted non-existence of tubercle bacilli in the phlyctenules, and, further, the present assertion that phlyctenulosis is a pseudotuberculous affection, due to the toxins of the tubercle bacillus.

Dr. John W. H. Eyre,¹ Hunterian professor, and examiner in bacteriology, Royal College of Surgeons, in his Hunterian lecture on "Tuberculosis of the Conjunctiva," makes this very emphatic pronouncement:

That many of those subject to phlyctenules give evidence of the existence of tuberculous infection in some portion of their tissues is no evidence that the conjunctival lesion is also tuberculous, and until some responsible observer has demonstrated the presence of the tubercle bacillus in an extended series of phlyctenules, I see no valid reason for regarding phlyctenular conjunctivitis, *per se*, as a form of tuberculosis of the conjunctiva.

* Read before the Section on Ophthalmology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Eyre, John W. H.: *Lancet*, London, 1912, i, 1319.

Dr. L. V. Hamman, chief of the Phipps Tuberculosis Dispensary of the Johns Hopkins Hospital, and one of the authors of Hamman and Wolman's authoritative work, "Tuberculin in Diagnosis and Treatment," in conversation with me, has expressed a similar view. The substance of his statement was that if the phlyctenules are a tuberculous manifestation they certainly *sometimes* should show the presence of the tubercle bacillus; otherwise the theory that they are of tuberculous origin is without warrant. He also drew attention to the fact, as bearing on the contention that the phlyctenules are a pseudotuberculous manifestation due to the toxins of the tubercle bacillus, that this view of the action of toxins is rapidly losing ground, and that very many pathologic lesions formerly accounted for in this way have since been proved to be due, not to the action of toxins, but to the presence in these lesions of the bacteria themselves.

Let us now take up in order the evidence on which the doctrine of the tuberculous nature of phlyctenular ophthalmia rests.

1. *The frequency with which the subjects of phlyctenulosis give a positive reaction to the von Pirquet and other diagnostic tuberculin tests.*

To this evidence the advocates of the doctrine can hardly attach much weight, since Hamburger of Vienna and others have shown that about the same percentage of positive reactions to the von Pirquet test is encountered in healthy persons as has been found in those with phlyctenulosis. On this point Eyre, already quoted, says:

I have come to regard a positive reaction to these [tuberculin skin] tests when occurring in an individual more than 1 or 2 years old as quite useless for purposes of diagnosis.

And, just as emphatically, Hamman and Wolman² say:

A positive reaction [to von Pirquet's test] is of considerable value in diagnosis during the first year of life, of less during the second, of little in childhood, and of none in adult life.

It is, perhaps, hardly necessary to remark that, in the absence of definite evidence of clinical tuberculosis, no competent and conscientious physician would feel himself warranted in employing tuberculin therapeutically, simply because the von Pirquet test elicited a positive reaction.

2. *The efficacy of tuberculin in the treatment of phlyctenulosis, especially in chronic cases and in preventing recurrent attacks of the disease.*

It has not been possible for me to make even an approximately thorough study of the extensive literature of the past few years dealing with the theory of the tuberculous nature of phlyctenular ophthalmia. Two important papers published in this country, however, which together include a summary of the results obtained in ninety cases of phlyctenulosis treated with tuberculin, seem to afford fairly conclusive evidence as to the efficacy of this treatment.

Fifty of these cases were reported by Dr. Richard J. Tivnen³ of Chicago in a paper read before the Section on Ophthalmology of the American Medical Association in 1911. It is to be regretted that, though

the author in the tabular report of these cases heads a column "Therapeutic Duration of Treatment," he gives under this heading only the date when the treatment was *begun*, and does not in a single instance mention its *duration*. Measurably to offset this omission, however, he states elsewhere that the shortest period of treatment of any case was "about three weeks," and the longest six months.

Turning to the column in which the duration of the disease before treatment was begun is given, we find that eleven of the fifty cases had existed three months or less. Of these only two had lasted this long, five were of two months' duration, one of six weeks, one of one month, one of two weeks, and one had existed only two days. None of these cases can be regarded as chronic in character, and that not one of them, not even that of two days' duration, was cured in less than "about three weeks" seems to afford but poor evidence of the value of the treatment employed. Indeed, when it is borne in mind that in addition to the administration of tuberculin the usual ocular treatment, such as yellow oxid of mercury, atropin, etc., was employed, that constitutional measures, such as regulation of the diet and hygienic conditions, were not overlooked, and further that "tonics" were administered, it is difficult to escape the conviction that the tuberculin was a definite handicap to the other very proper therapeutic measures, and that the results would almost surely have been more satisfactory had it not been employed. It may be added, as of interest, that in only six of the cases (12 per cent.) was there a history obtained of either active or latent tuberculosis.

The other paper referred to was by Davis and Vaughan,⁴ published in September, 1912. Like Dr. Tivnen, they also head a column in their tabular summary of forty cases of phlyctenular ophthalmia treated with tuberculin "Therapeutic Duration of Treatment," but, under this head, mention only when the treatment was begun. For this they make partial amends by stating, in another part of their paper, that the duration of treatment varied from "a few weeks" to eight months.

It is interesting to note that of the forty cases the result of the von Pirquet test was positive in only twenty-seven (67.5 per cent.), and was negative in thirteen cases (32.5 per cent.), hardly as large a percentage of positive results as might be expected in the same number of healthy persons.

Turning to their column showing the duration of the disease before treatment, we find no less than fourteen cases (35 per cent.), in which this is given as two months or less. Of these the duration of four was two months, three "off and on" for two months, four one month, one two weeks, and two one week. The same comment applies to these cases as to the acute cases of Dr. Tivnen's table. It seems remarkable that not one of these comparatively recent cases was cured in less than "a few weeks." That their results were even less favorable than those of Dr. Tivnen is doubtless accounted for by the fact that they employed no constitutional treatment but tuberculin and "but little local treatment," atropin having been used in but two cases. It may be added, as worthy of note, that but *one* of their cases showed

² Hamman and Wolman: Tuberculin in Diagnosis and Treatment, p. 126.

³ Tivnen, Richard J.: Tuberculin as a Diagnostic and Therapeutic Agent in the Treatment of Conjunctivitis Eczematosa (Phlyctenular Conjunctivitis and Keratitis), THE JOURNAL A. M. A., Dec. 9, 1911, p. 1886.

⁴ Davis, A. Edward, and Vaughan, Harry: Phlyctenular Conjunctivitis and Keratitis, with Special Reference to Etiology and the Value of Tuberculin as a Diagnostic Agent, Ophth. Rec., 1912, xxi, 476.

clinical signs of active or inactive tuberculosis—tuberculous glands of the neck being present in this case.

One of the best-equipped and most careful students of ocular tuberculosis in this country, Dr. George S. Derby of Boston, has probably had as large an experience with tuberculin in the treatment of phlyctenular ophthalmia as any one in America, and he has expressed his views very plainly as to its value in this condition. In discussing Dr. Bruns' paper on "Phlyctenular Ophthalmia and Its Etiology," in the Section on Ophthalmology of the American Medical Association, at Atlantic City, in June, 1912, he said:

I have had considerable experience with tuberculin in the treatment of these [phlyctenulosis] cases during the past five years, and I feel doubtful whether any of the cases have been much benefited by it.

And, again, in discussing Dr. Will Walter's paper, "Phlyctenular Ophthalmia and Episcleritis," before the same Section, in 1913, he said:

The use of tuberculin in phlyctenular disease is not often necessary. Most of these patients recover without tuberculin. Even though tuberculin is used, it is often extremely difficult to prevent repeated attacks in obstinate cases. . . . It is not nearly so important as general hygiene.

I have taken the liberty of italicizing this observation of Dr. Derby as to the inefficacy of tuberculin in preventing repeated attacks in obstinate cases of phlyctenulosis, for it is to be borne in mind that its efficacy in accomplishing just what Dr. Derby's experience shows that it does not accomplish has been cited as one of the proofs of the tuberculous nature of phlyctenular ophthalmia.

3. *The development of phlyctenular conjunctivitis and keratitis after application of tuberculin to the eye and after other diagnostic tuberculin tests.*

On this point Hamman and Wolman⁵ say:

In several thousand [ocular] instillations [of tuberculin] we have had but two untoward results, one patient developing phlyctenular conjunctivitis, which subsequently completely healed, the other, an episcleritis, which also healed, and which we are not sure was due to the test.

In my own mind there is little doubt that had the instillations in these several thousand eyes of persons whose condition seemed to demand a tuberculin test consisted of a 2 per cent. solution of silver nitrate or copper sulphate, a considerably larger number of phlyctenular cases would have developed; for every one of large experience in the management of ocular maladies has seen cases of phlyctenular keratitis or conjunctivitis which were provoked by the application of unduly severe remedies to the eye, and I can recall others in which the attack followed a slight traumatism, such as an abrasion of the cornea or bulbar conjunctiva.

Some who teach the tuberculous doctrine of phlyctenulosis hold that "some external, local stimulant is necessary to bring out the phlyctenules." If this view is correct, why, would ask, should not the tuberculin employed in the Calmette test, acting simply as a stimulant or irritant, occasionally produce this effect?

It is, perhaps, not so easy to explain satisfactorily the development of phlyctenules after the skin or subcutaneous tuberculin tests. It is to be said, how-

ever, that this is an unusual occurrence, and it may be questioned whether it ever happens, except in persons whose systemic condition is such that an outbreak of phlyctenulosis may be regarded as imminent. Under such circumstances it is readily conceivable that any added constitutional disturbance, such as the systemic effect of tuberculin, or that which might follow the ingestion of unwholesome food, may turn the scales, and precipitate the ocular inflammation, just as, under like circumstances, the application of any irritant to the eye may do.

4. *The occasional occurrence in phlyctenular ophthalmia of focal reaction following diagnostic or therapeutic injections of tuberculin or after the von Pirquet test.*

Dr. Tivnen in his paper, already quoted, mentions the occurrence of focal reaction after the von Pirquet test in four of his fifty cases of phlyctenulosis, but describes the reaction in three of these as being "slight." Drs. Davis and Vaugan in their forty cases mention three instances of focal reaction, one of these being "slight." If we interpret, and this seems not unwarrantable, the three "slight" reactions of Tivnen's series and the one of Davis and Vaugan's as "doubtful," we have in the combined series of ninety cases but three definitely positive focal reactions—a percentage of only 3.33. Although I am aware that it is not in accord with the commonly accepted view, I cannot persuade myself that any constitutional disturbance comparable to that produced by the von Pirquet test would not have influenced unfavorably the ocular inflammation quite as often and quite as markedly as happened in these ninety cases after the tuberculin test.

It is worthy of remark that in neither of the papers in question is there mention of focal reaction having resulted, in a single instance, from the *therapeutic injection of tuberculin*. If such reactions had been observed, it seems most improbable that they would not have been recorded as evidence in favor of the authors' views regarding the etiology of phlyctenular ophthalmia; if no such reactions occurred, the circumstance is certainly of much significance.

5. *The chronicity and tendency to recurrence of phlyctenular ophthalmia; its predilection for the poorly nourished and for those in whom the existence of the so-called strumous or scrofulous diathesis is manifest, and the glandular complications which frequently accompany it.*

As is universally recognized, phlyctenular ophthalmia is essentially a disease of childhood. In the exceptional cases encountered in adults it will generally be found that the affection first manifested itself in childhood, and has recurred from time to time in after years. These, in my experience, are the cases in which the "scrofulous" diathesis, the glandular complications, and not infrequently, I am willing to admit, definite clinical signs of tuberculosis, are found. On the other hand, the much larger number of cases encountered in childhood, which commonly respond promptly to treatment, and which, if they recur at all, do so only during childhood, do not show, or, at all events, very rarely show, any signs of scrofula or tuberculosis. These are the cases, I contend, which must be regarded as typical, and it is from the study of these cases that we must draw conclusions as to the etiology of the affection, and not from the exceptional and atypical cases encountered in adult life.

5. Hamman and Wolman: *Tuberculin in Diagnosis and Treatment*, p. 209.

What, then, does the study of these cases of childhood show? In the first place, it may be said that the children brought to our clinics with phlyctenulosis are usually not puny and ill nourished; on the contrary, they are commonly well nourished, and not infrequently have ruddy cheeks. Nine times in ten we find, as evidence of systemic disorder, in addition to the ocular inflammation, facial eczema, eczema perhaps elsewhere, and very often an eczematous nasal catarrh. On inquiry it will be learned that they are fed on nearly everything that a child should not eat, and that they are much too closely confined in rooms or dwellings that are thoroughly insanitary. Further, it will often be found that their tongues are furred, their bowels in a torpid condition, and that their stools are foul-smelling.

Perhaps I have already said enough to make it evident that I am a firm believer in the view formerly held by most ophthalmologists, and especially by German ophthalmologists, that phlyctenular ophthalmia, certainly as it is encountered in children, is an ocular eczema, and that it has just as much, and just as little, to do with tuberculosis as has the facial eczema which is its usual accompaniment.

Like the attendant eczema, phlyctenulosis is certainly the result of an endogenous infection, and without doubt—in my mind, at all events—this infection is from the alimentary canal—intestinal intoxication, as it is phrased nowadays. The investigations of Weeks and others, who have usually found the *Staphylococcus aureus* or *albus* present in the phlyctenules, as well as in the eczematous nodules, make it clear that these are the micro-organisms which, having gained entrance to the blood-stream, are commonly responsible for both the skin and the ocular lesions.

How much significance should be attached to the frequent presence of indican in the urine of those suffering with phlyctenular ophthalmia I do not pretend to decide; but investigators who do attach importance to this symptom, and who look for it systematically, report its presence, in large or moderate amounts, in nearly every case of the disease.

If there is any tuberculous affection—or, if you please; pseudotuberculous affection—that responds to local and constitutional treatment in the prompt manner that phlyctenular ophthalmia commonly does, I do not know of its existence. Certainly, true ocular tuberculosis shows no such response, even though tuberculin be employed; on the contrary, it is very intractable and difficult to control.

There are, indeed, few ocular maladies, in my experience, more amenable to judicious therapeutic measures than phlyctenular conjunctivitis and keratitis, and especially is this true of the many cases occurring in childhood. The measures which I employ are regulation of the patient's diet and habits of life, an energetic purgative, which should contain calomel, given at the outset and repeated, perhaps, in forty-eight hours, followed by the administration of syrup of the phosphates of iron, quinin and strychnin—rather than the commonly prescribed syrup of the iodid of iron—and atropin and yellow oxid of mercury ointment as routine local applications. I may add that I feel not a little "disgruntled" if the majority of my patients are not well in considerably less than three weeks.

CONCLUSIONS

The evidence adduced in support of the doctrine that phlyctenular ophthalmia is a tuberculous or pseudotuberculous lesion is far from convincing.

The frequency with which the subjects of phlyctenulosis give a positive reaction to diagnostic tuberculin tests is of little significance in view of the fact that the same tests show a scarcely smaller percentage of positive reactions in healthy persons.

There is excellent authority for the contention that "until some responsible observer has demonstrated the presence of the tubercle bacillus in an extended series of phlyctenules," or, at least, until it has been shown to be sometimes present, the assertion that the affection is, in any sense, tuberculous is without warrant.

In the present state of our knowledge of the etiology of phlyctenulosis, the employment of tuberculin as a therapeutic agent in this affection is unjustifiable, not only because the ill-considered use of tuberculin is capable of doing much harm, but also because the clinical evidence shows pretty clearly that, if it is not actually harmful, it surely is not helpful. Definite clinical signs of the existence of tuberculosis, apart from the ocular inflammation, may justify the administration of tuberculin, but even in such circumstances the effect on the eye could be only indirect.

As phlyctenulosis is essentially a disease of childhood, and the typical cases occur not in adult life, but in children, it is from the study of these cases that trustworthy conclusions as to the etiology of the affection are to be drawn. The study of these childhood cases shows, from the almost constant association of facial eczema with the ocular inflammation, that phlyctenular ophthalmia, as was formerly very generally held, is an ocular eczema, due, for the most part, like the facial eczema, to intestinal intoxication, and that tuberculosis is seldom, if ever, an etiologic factor.

Cathedral and Howard Streets.

ABSTRACT OF DISCUSSION

DR. W. E. GAMBLE, Chicago: It is most timely that Dr. Theobald has called our attention to this subject in the way he has. I believe the use of tuberculin in phlyctenular disease is not justified. In my hands, patients get well without tuberculin as quickly as with it. That this disease is tuberculosis is largely speculation. We are no nearer to-day knowing the etiology of these cases than we were forty years ago. There is some basis for the conclusion that this is ocular eczema, and yet we see cases with palpable cervical glands as the only comitant. The only cases of this disease that might possibly warrant the use of tuberculin would be when large, soft cervical glands, i. e., tuberculosis glands are present.

DR. A. E. DAVIS, New York: While the tubercle bacillus is not yet known to be the direct cause of phlyctenular ophthalmia, yet the tuberculotoxins are capable of causing the trouble. Phlyctenular ophthalmia is the result of some grave constitutional dyscrasia, and is not a simple affection of the eyes brought about by intestinal intoxication, and curable in a few days by regulation of the diet and the patient's habits, the giving of calomel and tonics, and local treatment with atropin and yellow mercuric oxid ointment. It is a grave disease, so far as sight is concerned; and, while the prognosis is favorable so far as concerns any single attack it is rendered unfavorable, as a whole, by the frequent recurrences.

In persons who have had many recurrences of conjunctivitis eczematosa the corneae often bear signs of past

attacks. Thus the sight is impaired, squint or myopia often develops, and children fall behind in development. A frequent outcome is secondary blindness, often many years after the inflammation has passed, representing the after-results of the corneal scars with inclusion of the iris.

1. Dr. Theobald entirely overlooks the fact that many healthy persons are infected with tuberculosis. Hamburger has shown by post mortem on 848 children, that "from newborn infants up to 14 years, an average of 40 per cent. had been infected. Infection up to 3 months of age in only 4 per cent., steadily increased with age until from 11 to 14 the percentage reached 70. The distinction between infection and clinical disease in these cases is important. It is significant that phlyctenular ophthalmia is rarely seen in children under 1 year. Stomach disturbances are most frequent up to this age, while tuberculous infections are fewest. Stomach troubles, therefore, seem not to be the true cause.

2. In the forty cases in which Dr. Vaughan and myself reported "cures" only after a "few weeks" treatment, even in acute cases, we continued the treatment, after the phlyctenules had disappeared, to prevent recurrences. The phlyctenules would often disappear in a few days, but no case is really cured until the patient reaches maturity, and sometimes not then.

3. Focal reaction to my mind is positive evidence of the tuberculous nature of the disease. This is most impressive, when, following the primary reaction of a diagnostic dose, the phlyctenules on the third or fourth day melt away as by magic. These patients should not be considered cured on the first disappearance of the phlyctenules, and subsequent smaller doses should be given to complete the cure.

Dr. Theobald thinks it significant that neither Dr. Tivnen nor Dr. Vaughan and I observed a single instance of focal reaction in the ninety cases reported by us, from the therapeutic injection of tuberculin. Dr. Vaughan and I purposely refrained from giving too large therapeutic doses, in order to avoid decided reactions. Focal reaction to tuberculin injections can be explained on no other ground than as the action of a true antigen on the specifically tuberculous diseased eye.

4. He who does not believe in the administration of tuberculin until the clinical signs of tuberculosis are present, fails to recognize the most essential feature of the tuberculin treatment. I would just as soon delay treatment in a suspected case of syphilis, after a positive Wassermann, until clinical signs of that disease appeared.

DR. GEORGE H. DERBY, Boston: With regard to the necessity of showing the tubercle bacillus in the phlyctenules, I will remind you of the difficulty of finding the tubercle bacillus in chronic tuberculosis of the eye. Certainly the tubercle bacillus which may be responsible for phlyctenule is very different from the tubercle bacillus responsible for acute tuberculosis of the eye and also in chronic ocular tuberculosis. The pathologic picture is atypical, but the fact that it is not typical does not prove that these lesions may not be tuberculous. I have seen a few cases in children starting as a phlyctenular keratitis and later on becoming a deep-seated, chronic ocular tuberculosis. I recently talked with one of the social workers of the Massachusetts Charitable Eye and Ear Infirmary to whom the phlyctenular cases had been assigned on account of her previous experience in a tuberculosis hospital. She called attention to the fact that in a large percentage of the families she visited in which there was phlyctenular disease, one or more members of the family showed tuberculosis. Even if we are not sure that phlyctenular disease is actually due to tuberculosis it would be better if we assumed that it was, because the problem is essentially the problem of tuberculosis. If the children are treated as tuberculous they recover much more quickly and it is better for all concerned. In long-standing cases that are resistant and show repeated attacks of the disease, there is nothing better than sanatorium treatment. If the patients can be sent to a sanatorium for three, six or nine months they come back entire, different children and are more apt to be free from the disease afterwards.

DR. HARRY VAUGHAN, Morristown, N. J.: I wish to say concerning the point that the germ cannot be found in the lesion, that the products or ferments of tuberculosis do not digest surrounding tissues, as do the products of the staphylococcus, streptococcus and other bacteria. I think that fact makes it difficult to find the germ. Possibly the germ is not present, but the by-products cause the lesion. We do not give the tuberculin treatment to every child. We study our cases carefully to see whether tuberculous symptoms predominate. We examine the glands and take the temperature, and surely the local, the focal and the constitutional effect of the tuberculin test must mean something. We have had cases in which in twenty-four hours the lesions would be lighted anew. In many instances we could find tuberculosis in two or three generations. I really believe when tuberculous symptoms predominate, when we have a local, focal and constitutional von Pirquet, with large glands and a tuberculous history, tuberculin will be found to be not a sovereign remedy, but a great help, as much so as the Flexner serum in meningitis. It has not cured all the cases but it has reduced the mortality. So with tuberculin.

DR. RICHARD J. TIVNEN, Chicago: Dr. Theobald is correct when he insists that every item of Koch's law be fulfilled before the tuberculous etiology of phlyctenulosis be accepted. Some, however, are unwilling, even in the absence of direct confirmation, lightly to cast aside the clinical evidences exhibited by these cases, which suggest some type of tuberculous origin. The symptom-complex exhibited by these cases, the clinical course of the malady, its predilection for the poorly nourished, its glandular complications, its association with tuberculous processes in other parts of the body, its tendency to recurrence, its response to tuberculin—strongly support the theory of tuberculosis, even though alone they are not conclusive. What positive proof is at hand conclusively to determine that phlyctenulosis is produced by intestinal intoxication alone? That the tuberculous theory has not as yet been scientifically established is not a reason for ignoring all the strongly suggestive evidences in its favor. There are many reasons why final judgment on this question should be withheld. We still have much to learn in our clinical observations and interpretations, and particularly in our laboratory diagnoses. May it not be that the refinements of diagnosis necessary in this investigation have not been sufficiently exhausted; that some anatomic variation of the ocular tissue presents peculiarities not yet recognized or understood; that some vagary of the invading organism presents difficulties in the way of establishing its identity; and may not the tuberculous process itself exhibit vagaries which we are unable, with our present methods of investigation, to discover? Is it wise, therefore, lightly to cast aside a theory of etiology which has considerable evidence in its favor, simply because it lacks confirmation? Dr. Theobald refers to eleven cases which my table reports as existing "three months or less" and, applying my statement that none were cured in less than three weeks, observes that it "affords but poor evidence of the value of the treatment employed," and further that because other constitutional and local measures were also used, it is difficult to escape the conviction that the tuberculin was a definite handicap to the other therapeutic measures, and that the results would almost surely have been more satisfactory had it not been employed. Many difficulties surrounded the treatment of my cases; the patients were mostly ambulatory and a regular, systematic plan of treatment was impossible. It may thus be understood why many of them failed to show improvement in less than three weeks. Dr. Theobald will see, in my final report of these cases, that not one of the eleven failed to show improvement and five of them were listed as "cured." These results are fully as satisfactory as the usual methods advocated that fail to check the recurrences of this disease, which are the crux of the problem, for with each recurrent attack, perceptible inroads on the patients' visual acuity results.

In view of the almost absolute failure of the present treatment to prevent recurrences of this disease, the advocates of the tuberculous theory feel the need of a more definite

plan of therapeutics and believe that sooner or later the theory of tuberculosis as the dominant etiologic factor in the disease will be recognized, and that tuberculin will constitute the essential therapeutic agent in its treatment.

DR. WALTER B. WEIDLER, New York: I spoke on this same subject at Minneapolis when discussing Dr. Davis' paper, and I wish again to put myself on record as believing thoroughly in the use of tuberculin from my experience in the Manhattan Eye and Ear Infirmary. I think the attitude assumed by Dr. Theobald with regard to phlyctenulosis is unfortunate. Three years ago Dr. Bruns thought none of these cases were tuberculous. Dr. Tivnen thinks that almost all of them are and Dr. Theobald that probably few or none are. I think the fact that the tubercle bacillus cannot be demonstrated is a poor argument. Dr. Gamble says he would be willing to use tuberculin in cases with enlarged glands. As far as I know, the tubercle bacillus has been demonstrated in these glands before they have broken down and pus has formed. My feeling is that in cases of phlyctenulosis with recurrences the majority of the patients will give a history of tuberculosis in some member of the family if we will only take the trouble to trace it back. That has been my experience in my work at the Manhattan. At present I believe that many of these cases are due to a toxin or an endotoxin from a tuberculous focus somewhere else in the body, not of necessity in the eye. In the eye we can readily see the manifestation of any tuberculous process in other tissues of the body. The one reason that so many do not believe in tuberculin therapy in these cases is that they do not follow their cases long enough. I have seen probably three hundred cases in the last three years. They will recur, but my feeling is that with tuberculin we produce an indefinite immunity, and just how long it lasts we do not know. With a tuberculous tendency and inheritance I do not believe we can eradicate it by one course of tuberculin treatment no matter what the manifestation is in the eye. I made the statement at the New York Academy of Medicine last winter that when I had a positive von Pirquet I have never failed to cure the lesion, whether a tuberculous choroiditis or iridocyclitis, of which latter we have four under observation at present, or the severest form of keratitis or ulcer of the cornea. Unfortunately this statement must be corrected as I have had, since that time, a youth of 10 with fibrous connective tissue exudate in the pupillary area, which did not absorb under tuberculin treatment but the active iridocyclitis cleared up with the use of tuberculin. This, however, cannot be claimed as a cure due to tuberculin.

DR. THOMAS H. CURTIN, New York: I have seen all of Dr. Weidler's cases and he has seen mine. For the past three years we have been making a systematic study of phlyctenular cases and other cases which we regarded as tuberculous, using usually the von Pirquet test for diagnosis. On the phlyctenular cases over 80 per cent. (in children under 10 years of age) reacted positively to this test. A certain percentage of cases, which, from the general appearance of the patients was due in my opinion to gastrointestinal conditions, did not react. These cases readily cleared up under the use of calomel, rhubarb and soda and yellow mercuric oxid. But we see also the recurrent cases, and some which had been previously treated by the ordinary method did not return when put on tuberculin, showing that the tuberculin treatment had proved more efficacious than the ordinary treatment. I do not believe that all phlyctenular cases are tuberculous, but that phlyctenular conjunctivitis is allied to tuberculosis, as are cases of strumous or scrofulous diathesis. These cases may not be tuberculous *ipso facto*, but dependent on an underlying condition which may be tuberculous and which I believe in 80 per cent. is tuberculous. As Dr. Davis said, the injection of tuberculin into the arm does not mean that the tuberculin is disseminated throughout the tissues of the body, but that it stays at the point of injection and manufactures antibodies which neutralize the toxins of the tubercle bacilli and destroy the tubercle bacilli themselves. In my experience and in the observation of a great many others I have yet to see or hear of any ill effects

produced by tuberculin either in the use of the von Pirquet test or the subcutaneous test for diagnosis or in the administration of tuberculin when properly used for the treatment of any tuberculous disease of the eye. Tuberculin was formerly used in too large doses. We should begin with from 1/80,000 to 1/50,000 mg., gradually increasing, keeping the patients under treatment for from six months to two years. We cannot cure them in a short time, and they should return again at intervals and have the tuberculin injected in order to keep up the production of these antibodies, which is the keynote of the therapeutics.

DR. WILLIAM TARUN, Baltimore: Four facts should be borne in mind in considering phlyctenular ophthalmia: 1. We have no way of making a diagnosis of lymphatic tuberculosis except by the skin reaction or the subcutaneous test. 2. The anatomic structure of the conjunctiva is practically the same as that of adenoids and tonsils. 3. The enlarged glands are caused by the secondary infection by pyogenic organisms. 4. In all cases of phlyctenulae we have intestinal intoxication as indicated by the presence of indican in the urine.

Dr. Theobald has stated that, so far, we have no positive evidence that phlyctens are tuberculous because of the absence of the tubercle bacilli. It is evident that there is a tuberculous basis plus a secondary infection by a pyogenic organism—*Staphylococcus aureus*. To those who are not yet convinced that there is a tuberculous basis I would suggest the study of an article on this work done by Rubert (*Monatsbl. f. Augenheilk.*, September, 1912). It is a continuation of work done by some one else in which he has produced tuberculosis in lower animals, using a normal one as control. Instillations of staphylococcus cultures or toxins into the conjunctival sac of these animals produced phlyctens in a majority of the tuberculous and none in the normal. These phlyctens had the same histologic structure as that of Fuchs. The presence of the tubercle bacillus is not known. As to treatment, tuberculin should be used when we cannot handle the cases in any other way. The initial dose will depend on the reaction by the von Pirquet test. In those cases in which you are afraid to use tuberculin I would suggest the treatment outlined by Dr. Derby—that the cases be sent to a sanatorium. I grant that the treatment as outlined by Dr. Theobald does some good. They are relieved from their symptoms, but they still have a more serious condition remaining—a tuberculosis. A case in point. I was called to see a plethoric, healthy-looking child of 2½ years with a typical phlycten for which I prescribed the usual treatment, but advised the physician that the child had a tuberculosis as the basis of the trouble. Three months later the child died of a tuberculous meningitis. Those of you who do not recognize the tuberculous basis of phlyctenular ophthalmia are not doing all you should do for your patient.

DR. MARK D. STEVENSON, Akron, O.: The one thing that demands challenge in the conclusions of Dr. Theobald is whether or not this disease is tuberculous. This can not be settled; it must be speculative. The elusiveness of the germ is well understood, not being necessary in the lesion. The other symptoms of tuberculosis are present. The full pathology of tuberculosis like that of many other diseases is not entirely written. When it is I think it will be found that phlycten is one of the tuberculous lesions, and the thing that especially appeals to me, although it might be speculative, is that it responds to general tuberculosis treatment. I have seen these conditions respond quickly and I think it would be most unfortunate if the idea should go out from this section that it was at all proved that these lesions are not of a tuberculous nature.

DR. SAMUEL THEOBALD, Baltimore: I still think there are very few maladies of the eyes that respond so promptly and so satisfactorily to treatment as phlyctenular disease. Of course I recognize that there are exceptions to this rule, but it does not strike me that it is a very serious affection. The patients that recover do not take three weeks. The majority are cured within little more than one-third of this time. When recurrences take place this is due, in the majority of cases, to the carelessness of parents or those in charge of patients

AMETROPIA—ZENTMAYER

Jour. A. M. A.
Aug. 15, 1914

in not following out the directions of the medical attendant. I do not think I could have understood Dr. Davis correctly when he said a positive Wassermann reaction and a positive von Pirquet, so far as treatment is concerned, are equivalent. Everybody knows that in the absence of clinical signs of tuberculosis a positive tuberculin reaction does not call for treatment for tuberculosis. It does not mean clinical infection of the system has occurred. On the other hand, a positive Wassermann means syphilis and is a clear indication for antisyphilitic treatment. Dr. Stevenson spoke especially of the elusiveness of the tubercle bacillus. The authorities I have quoted do not pretend to say that the bacillus must be found every time. One says it must be found some times. The other says that, at least, some responsible investigator should find it in a series of cases. After I had written the paper I wrote letters to seven eminent authorities on tuberculosis throughout the country asking their experience as to the association of phlyctenular ophthalmia with tuberculosis. In their replies several spoke of having encountered cases of phlyctenulosis in children in the so-called scrofulous condition, and in association with glandular and bone lesions of a tuberculous nature; but they all agreed that it was seldom found in association with pulmonary tuberculosis. One charge of the Maryland State Tuberculosis Sanatorium. He wrote: "We see surprisingly little phlyctenular disease in association with tuberculosis. We have had only six cases in the past year in handling about eight hundred cases of tuberculosis. Of this number fifty were in children. We have had but three cases among our children."

A STUDY OF THE EFFECT ON HETERO- PHORIA OF THE CORRECTION OF AMETROPIA WITH A CONSIDERATION OF SOME ASSOCIATED CONDITIONS *

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This analysis was undertaken to determine the effect on heterophoria of the correction of ametropia. In the development of the paper the relation of other factors to the problem brought in additional data. The opportunity which this afforded of analyzing these correlated conditions was embraced and the results incorporated.

The material used was supplied from my private case-records. No case was used unless at least a month had elapsed between the original and final tests. In more than two-thirds of the cases several years intervened, the second determination being made on the patient's return for a change of glasses. Only cases were used in which there was equal and normal, or better than normal, vision in each eye, and in which no actual deviation of the visual axes existed. No case in which prisms had been worn was considered available. Presbyopia was excluded. Only cases were used in which uniform tests had been employed in the various determinations.

As there is a marked discrepancy between some of the results given here and those heretofore published by other writers, it is well to state the methods employed by me in making the various tests. In testing both the far (6 meters) and the near (1/3 meter) status of the muscle balance a colored Maddox

rod was used, a light 1 cm. in diameter serving for the distant object and a small electric lamp for the near object. Loose prisms or the phorometer, along with the Maddox rod, was used to measure the degree of imbalance for both the vertical and lateral muscles at infinity and the rotary prism at near. Abduction and adduction were determined by loose prisms. In the past few years when a patient with but slight effort reaches an adducting power of 15 degrees it has been

TABLE 1.—MUSCLE BALANCE AT FIRST AND AT FINAL TEST

Ametropia	Far		Near		Hyperph. Per Cent.	Ab.	Ad.
	First Test	Final Test	First Test	Final Test			
H + Ah	Es. 2.5	Es. 1.75	Ex. 5.0	Ex. 4.5	26	6.0	17
H + Ah	Ex. 1.62	Ex. 1.5	Ex. 8.0	Ex. 9.0	59	6.5	14
H + Ah	Orth. 0.0	Ex. .37	Ex. 6.5	Ex. 6.0	40	6.0	17
H + Ah	Es. 2.0	Es. 2.62	Es. 6.62	Es. 3.62	25	5.5	20
Ah	Es. 6.0	Es. 4.62	Es. 2.5	Ex. .75	57	7.0	20
Ah	Ex. 1.37	Es. 1.0	Ex. 4.0	Ex. 4.5	50	6.0	..
M + Am	Es. 2.50	Ex. 1.87	Ex. 7.0	Ex. 4.0	50	..	..
M + Am	Ex. 2.25	Ex. 1.50	Ex. 1.5	Ex. 1.25	35	6.0	19
Amh	Es. 1.75	Es. 3.0	Ex. 10.0	Ex. 11.0	61	7.0	10
Amh	Ex. 1.62	Ex. 2.37	Ex. 4.75	Ex. 13.0	20	7.0	12
Amh	Orth. 0.0	Ex. .62	Ex. 13.0	Ex. 7.0	20	7.0	14
Anisom	Es. 2.0	Es. 1.37	Ex. 6.0	Ex. 5.62	50	6.0	16
Anisom	Ex. 2.5	Ex. 1.25	Ex. 9.0	Ex. 10.0	40	7.50	12

The average hypermetropia in the cases of H + Ah with esophoria for distance and exophoria for near equals 1.50 D.
The average hyperopia in the cases of H + Ah with exophoria for distance and near equals 1.12 D.
The average myopia in the cases of M + Am with esophoria for distance equals 1.87 D.
The average myopia in the cases of M + Am with exophoria for distance equals 2.12 D.

recorded 15+ as experience has shown that these patients readily acquire a high prism adduction by exercise or by knack.
For the purpose of study the cases were divided into groups having like ametropia, and these were subdivided into groups having similar muscle imbalance for distance (Table 2).

TABLE 2.—GROUPS AND SUBGROUPS OF CASES

Ametropia	No. of Cases	Muscle Imbalance for Distance	Per Cent.
H + Ah	236	Orthophoria	10
Ah		Esophoria	62
M + Am	20	Esophoria	28
Amh	87	Esophoria	60
	30	Esophoria	40
Anisometropia	24	Orthophoria	60
		Esophoria	40
		Esophoria	24
		Orthophoria	52
		Esophoria	24
		Esophoria	15
		Esophoria	25
		Esophoria	60

There were 145 cases of H + Ah, with esophoria for distance and exophoria for near. The average esophoria for distance at the first test was 2.5°, and at the final test 1.75°. The average exophoria for near at the first test was 5°, and at the final test 4.5°. Average abduction was 6°, adduction 17°. Hyperphoria in 26 per cent.
There were 66 cases of H + Ah, with exophoria for distance and near, greater for near. Average exophoria for distance at the first test, 1.62°, at the final

* Read before the Section on Ophthalmology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

test 1.5°. Average exophoria for near at first test 8°, at the final test 9°. Average abductions 6.5°, adduction 14°. Hyperphoria in 59 per cent.

There were twenty-one cases of H + Ah with orthophoria for distance and exophoria for near. The average exophoria for distance at the final test was 0.37°. Average exophoria for near at the first test 6.5°, at the final test 6°. Average abduction 6°. Average adduction 17°. Hyperphoria in 40 per cent.

There were thirteen cases of H + Ah in which there was esophoria for both distance and near with a greater degree for near. The average esophoria for distance at the first test was 2°, at the final test 2.62°. The average esophoria for near at the first test was 6.62°, at the final test 3.62°. Average abduction 5.5°. Average adduction 20°. Hyperphoria in 25 per cent.

There were ten cases of H + Ah with esophoria for both distance and near with a greater degree for distance. The average esophoria for distance at the first test was 6°, at the final test 4.62°. The average esophoria for near at the first test was 2.50°. This was converted into an average exophoria at the final test of 0.75°. Average abduction 7°. Average adduction 20°. Hyperphoria was present in 57 per cent.

There were twelve cases of Ah with esophoria for distance. The average esophoria for distance at the first test was 1.37° and at the final test 1°. The average exophoria for near at the first test was 4° and the final 4.5°. Average abduction was 6°. Hyperphoria was present in 50 per cent.

There were eight cases of Ah with exophoria for distance. The average exophoria for distance at the first test was 2.50° and at the final test 1.87°. The average exophoria for near at the first test was 7° and at the final 4°. Hyperphoria present in 50 per cent.

Of eighty-seven cases of M + Am, fifty-six had esophoria for distance and thirty-one had exophoria for distance.

Of the fifty-six cases of M + Am with esophoria for distance the average esophoria at the first test was 2.25° and at the final test 1.50°. The average exophoria for near at the first test was 1.50° and at the final 1.25°. Average abduction 6°. Average adduction 19°. Hyperphoria in 35 per cent.

There were 31 cases of M + Am with exophoria for distance, and greater exophoria for near. The average exophoria at the first test was 2.75°, and at the final test was 3°. The average exophoria for near at the first test was 10°, and at the final test 11°. The average abduction was 7°. Average adduction was 10°. Hyperphoria was present in 61 per cent.

There were 30 cases of Amh. In 16, with esophoria for distance. The average esophoria for distance at the first test was 1.75°, and at the final test 1.62°. The average exophoria for near at the first test was 2.37°, and at the final test 4.75°. The average abduction was 7°. The average adduction 12°. Hyperphoria was present in 20 per cent.

There were 7 cases of Amh with exophoria for distance and near. The average exophoria for distance at the first test was 1.62°, the average at the final test was 62°. The average exophoria for near at the first test was 13°, and at the final test 13°. The average abduction 7°. The average adduction 14°. Hyperphoria was present in 20 per cent.

There were 7 cases of Amh with orthophoria for distance and exophoria for near. The average exo-

phoria at the final test for distance was 0.50°. The average exophoria for near at the first test was 7°, and at the final test 7°. Average abduction was 7°. The average adduction 15°. Hyperphoria was present in 20 per cent.

There were 24 cases of anisometropia, in which the average difference in refraction of the two eyes was 2 D. In 15 there was esophoria for distance. The average at the first test was 2°, and at the final test 1.37°. The average exophoria for near at the first test was 6°, and at the final test 5.62°. The average abduction was 6°. The average adduction was 16°. Hyperphoria was present in 50 per cent.

In 6 cases of Amh there was exophoria for near and far, greater for near. The average exophoria for near at the first test was 2.5°, at the final test 1.25°. The average exophoria for near at the first test was 9°, and at the final test 10°. The average abduction was 7.5°, and adduction 12°. Hyperphoria was present in 40 per cent.

An analysis of these findings with a view of determining the influence of the correction of the ametropia on associated heterophoria shows that: When in H + Ah esophoria existed for far and exophoria for near the esophoria was reduced on the average of 0.75°, or about 33 per cent. of the original amount, whereas the exophoria which was present for near was reduced 0.5°, or 10 per cent. of the original amount, a negligible amount. The esophoria in this status of the muscles has been held by some to be an apparent esophoria, the real difficulty being an insufficient convergence power. The correction of the H + Ah would tend further to reduce the positive portion of convergence, and we might expect to find the exophoria for near, at least, somewhat increased; but it remained practically unchanged. The esophoria, however, was reduced, rather indicating that it arises from the convergence associated with the accommodation required for distinct distance vision.

When exophoria existed for both distance and near with a greater amount for near, practically no change occurred in the distance exophoria, and the exophoria for near was increased 1°, or 12 per cent. of the original amount. Here we have a convergence insufficiency with a beginning divergence excess, and the correction of the H + Ah would tend to increase the exophoria for near by reducing the call on the accommodation. Practically the only cases calling for prism exercise fell within this group. Almost all were relieved of symptoms, and in nearly all of those in which the exophoria was not greater than 2° for distance, it was either overcome or a low esophoria was established; but this did not persist for any great length of time after the prism exercise was discontinued. The relation of prism abduction and adduction was in almost every instance 1:2 (6:13), not very different, however, from those in which prism exercise was not required (6:15).

When orthophoria existed for distance and exophoria for near, an average exophoria of 0.37° developed for distance, and the exophoria for near increased 2°, or 33 per cent. of the original amount.

Here we have practically the same condition and the same result as in H + Ah with exophoria for distance and a greater exophoria for near.

When esophoria existed for both distance and near, but was greater for near, the esophoria for distance decreased on the average 0.62°, or 33 per cent. of the

original amount, and the esophoria for near was decreased, on the average, 3° , or 45 per cent. of the original amount.

These are cases of convergence excess in which the esophoria for near is decidedly decreased by correction of the $H + Ah$.

When esophoria existed for distance and near, but was greater for distance, the esophoria for distance decreased, on the average, 1.37° , or 23 per cent. of the original amount, and the esophoria for near was converted into an exophoria of 0.75° , a change of 133 per cent.

This group represents a convergence excess with a relative divergence insufficiency, the correction of the ametropia markedly decreasing the esophoria for near.

In Ah with esophoria for distance, the correction of the ametropia had no effect on either the distance or near heterophoria.

In Ah with exophoria for distance, the exophoria for both distance and near was appreciably diminished, probably the result of the improvement in vision from the correction of the astigmatism.

When in $M + Am$ esophoria existed for distance and exophoria for near, the esophoria for distance was reduced 0.75° , or 33 per cent. of the original amount, and the exophoria for near was reduced 0.25° , or 16 per cent. of the original amount.

The cases in this group are largely accommodative convergence insufficiency without the later-imposed divergence excess. The decrease in the esophoria for distance was due to the beginning development of a divergence excess, 16 per cent. of the cases showing a change from esophoria to exophoria, and 50 per cent. a decrease in the esophoria for distance. The average exophoria for near was but little influenced, but the cases showing a moderate amount of exophoria for near at the first test nearly all showed an increase in the exophoria.

When in $M + Am$ exophoria existed for distance and for near, the exophoria for distance was reduced 0.25° , or 9 per cent. of the original, and the exophoria for near was increased 1° , or 10 per cent. of the original.

In this group there was a convergence insufficiency and a divergence excess, the elements making for the development, in time, of a divergent strabismus. The average change was so slight, however, as to indicate an arrest of this progress, although in a few cases it had made advances.

When in Amh esophoria existed for distance and exophoria for near, the esophoria remained practically unchanged and the exophoria for near increased 2.37° , or 100 per cent. In this group the slight esophoria for distance which was present may be considered a static condition. The exophoria increased to a marked degree, and this may be due to the accommodative effort occurring in the course of the altering refraction which these cases undergo.

When in Amh , exophoria existed for distance and for near, but was greater for near, the exophoria for distance was reduced 1° , or 60 per cent. of the original, and the exophoria for near remained unchanged.

When orthophoria existed for distance and exophoria for near, exophoria of 0.50° , or 60 per cent. of the original, developed, and the exophoria for near remained unchanged.

These two groups show but little change, probably because these cases showed little change in the refraction

in the very few cases in which an opportunity had been presented to re-refract after the lapse of time, and a disturbance of the relation between accommodation and convergence was not induced by the correction of the refraction error. When the few cases were assembled into three groups, the number in each was so small that deductions were difficult to make.

When in anisometropia esophoria existed for distance and exophoria for near, the esophoria for distance decreased 0.50° , or 25 per cent. of the original, and the exophoria for near was practically unchanged.

When in anisometropia exophoria existed for near and distance, but greater for near, the exophoria for distance decreased 1.25° , or 50 per cent. of the original, and the exophoria for near increased 1° , or 11 per cent.

These cases showed no greater degrees of heterophoria than the other forms of ametropia, and were little changed by the correction of the error of refraction, except that those showing exophoria for distance had this decreased by equalization of the visual acuity of the two eyes.

In a short series of cases such as was here analyzed, it is possible for a few cases of marked heterophoria to produce an average relatively too high or vice versa. It was thought that this might, in a measure, be a possible source of error, and be neutralized by giving the percentages, in the two main groups, $M + Am$ and $H + Ah$, of cases showing a similar change. These groups were further analyzed to determine the relation existing between the abducting power and the distance imbalance.

Of the cases of $H + Ah$ with esophoria for distance and exophoria for near, in 25 per cent. there was an increase in the esophoria, the average being 2.37° , and the greatest 4° . In 57 per cent. there was a decrease of esophoria, the average being 2° , the greatest 9° . In this series there was a much larger number of cases showing an appreciable decrease of esophoria than was the case in other of the H series. The average abduction equaled 6° . In 30 per cent. in which it was above the average, the esophoria equaled 2.37° . In 70 per cent. in which it was below the average, the esophoria equaled 2.62 per cent. In a series in which abduction was 5° or below the average, esophoria equaled 3.5° , and in a series in which it equaled 7° or more than the average, esophoria equaled 1.75° .

Of the cases of $H + Ah$ with exophoria for distance and near, in 35 per cent. there was an increase in the exophoria. The average was 1.37° , and 40 per cent. showed a decrease, the greatest being, 2° , the least 1° .

The average abduction was 6.5° . In 50 per cent. it was above the average, and in 40 per cent. it was below the average, but in both the average exophoria equaled 1.5° . In a series in which it was 5° or below, the average exophoria for distance was 3.5° .

Of the cases of $M + Am$ with esophoria for distance, in 30 per cent. there was an increase in the esophoria, the average increase was 1.12° , and the greatest was 3° .

Abduction was below the average in esophoria associated with ametropia of any form, and was of equal degree both in the myopic and hyperopic groups.

Abduction was above the average in exophoria associated with ametropia of any form, and was about equal in exophoria for distance both in the hyperopic and the myopic groups.

Abduction was above the average and of equal degree in Amh, no matter what the distance balance.

In 45 per cent. there was a decrease; the average was 2.25°, the greatest 7°.

From the frequency with which right hyperphoria occurred in the foregoing cases, it was evident that right hyperphoria prevailed to a marked degree. As in a tabulation of one hundred cases on another occasion the percentage of right hyperphoria was found to be about 70 per cent., a further series of 200 cases, none of which had been employed in the previous computations, was used. In 105, or 52 per cent., there was orthophoria for the vertical muscles. In 95, or 48 per cent., there was hyperphoria. In 76 per cent. of these it was R. H., and in 24 per cent. L. H. As in making the tests the rod had been invariably placed before the right eye, it was thought that this might in some way be the cause of the preponderance of R. H., but Dr. Holloway found the same preponderance of R. H. when the rod was placed in front of the left eye. Possibly the fact that the right eye is usually the dominant eye is a factor. Forty-six per cent. of H + Ah, 50 per cent. of Ah, 53 per cent. of M + Am, 40 per cent. of H, 38 per cent. of Amh and 50 per cent. of anisometropia showed hyperphoria.

In 74 cases (78 per cent.) it was less than 1°, in 38 cases (40 per cent.) it was 1.4°, in 9 cases (9.5 per cent.) it was 1°, in 3 cases (3 per cent.) it was 1.5° and in 5 cases (5 per cent.) it was 2°. In 4 cases (4 per cent.) it was over 2°. It was found that in less than 1 per cent. was the hyperphoria appreciably altered by correction of the ametropia.

Hyperphoria was present more often in exophoria for distance than in esophoria for distance in the proportion 46:36. It was least frequent and occurred in the same ratio (20 per cent.) in all forms of heterophoria associated with Amh.

CONCLUSIONS

On the whole, it cannot be said that the correction of ametropia greatly influences the associated heterophoria, some of the change here noted being the result of the natural progress of such associated conditions, as evidenced by the fact that a study of a series in which but two weeks intervened between the tests before and after the ametropia had been corrected showed even less change. In a short series of H + Ah with esophoria for distance, exophoria first test 1.37°, final test 1.25°; exophoria for near, first test 6.5°, final test 6.5°.

Considering only the heterophoria, it may be said that the correction of the ametropia reduces the esophoria for distance when associated with H + Ah, and tends to increase the exophoria for near.

When esophoria exists both for distance and near, the heterophoria at both distances will be reduced and the esophoria for near may be converted into an exophoria. Esophoria for distance and likewise an exophoria for near will be reduced by the correction of M + Am.

Exophoria for distance and near will be practically unchanged by the correction of a coexisting M + Am.

Esophoria for distance will be little changed or may go over into an exophoria by the correction of an associated Amh. An exophoria for near, under like conditions, will be increased.

Exophoria for distance in anisometropia will be decreased by the correction of the ametropia.

In no group of cases did the average abduction exceed 7°; the average in all groups was 6.5°.

Hyperphoria occurs in less than 50 per cent. of cases of ametropia. It is somewhat more frequent in H + Ah. In more than three-fourths of the cases it is less than 1°, and in less than 10 per cent. it is 2° or more. Right hyperphoria vastly predominates.

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ABSTRACT OF DISCUSSION

DR. A. E. DAVIS, New York: The value of Dr. Zentmayer's observations are added to also from the fact that the tests have been uniform, have been made by one surgeon and the cases are from private practice, insuring a greater degree of intelligence and help from the patient than can possibly be obtained from hospital subjects. It seems to me that Dr. Zentmayer does not give himself due credit, nor does he attach enough importance to the influence that the proper correction of ametropia has on heterophoria. In his conclusions, he says: "On the whole, it cannot be said that the correction of ametropia greatly influences the associated heterophoria, etc. Turning to the body of the paper and looking at that group of cases of H and Ah (by far the largest group in the series, 145 cases), in which there was an associated esophoria for the distance and an exophoria for the near, we find that the correction of the refraction reduced the esophoria in the average $\frac{3}{4}$ of a degree, or about 33 per cent. of the original amount, whereas the exophoria which was present for near was reduced $\frac{1}{2}$ degree, or about 10 per cent. of the original amount, a negligible amount." Now I hold that an improvement of 33 per cent. in the esophoria for far and 10 per cent. in the exophoria for near, both of which improvements are in the direction of orthophoria, is a very important factor in helping to bring about relief from asthenopia, if the asthenopia is due to the so-called muscle imbalance. Again, in other groups, "when esophoria existed for both distance and near, but was greater for near, the esophoria for distance decreased on the average 0.62 degrees, or 33 per cent. of the original amount, and the esophoria for near decreased, on the average, 3 degrees, or 45 per cent. of the original amount." Take another group of cases reported by Dr. Zentmayer, H, plus Ah, in which esophoria existed both for distance and near, but was greater for distance, the esophoria for distance decreased, on the average, 1.37 degrees, or 23 per cent. of the original amount, and the esophoria for near was converted into exophoria of 0.75 degree, a change of 133 per cent.! Certainly this is a remarkable change, and the influence exerted by the glasses a most decided one. And when we take into consideration that Dr. Zentmayer recorded no higher degree of esophoria than 15 degrees (when it was higher than 15 degrees, he simply added a plus sign to it) this improvement in these cases as measured by other standards would be greater still. While it must be admitted that in some of the subgroups, especially in the myopic cases, the improvement in the direction of orthophoria is small, or even in the opposite direction, yet, on the whole, and particularly in H Ah, and in anisometropia, the class of cases in which asthenopia is most often present, the influence of glasses on the associated heterophoria is decided and in the right direction, for the most part, that is, towards orthophoria. Landolt has justly emphasized, in all his writings, the necessity of a greater quantity of latent reserve force in the muscles of orientation of the eyes than even for the muscle of accommodation, if we may expect the eyes to be used for a long time without fatigue or without asthenopic symptoms appearing. Hence, any factor that tends to increase this reserve force in the muscles of orientation, as the adjustment of correcting glasses, plays a most important rôle in the relief of asthenopia. Dr. Roosa held to the view that, when the refractive errors were corrected by the adjustment of the right glasses, muscle insufficiencies, in the vast majority of instances, corrected themselves, especially in cases of H and H astigmatism and anisometropia. He placed little or

no reliance on prism exercises in these cases, and I must say that my experience coincides with this view. I would mention one other important factor in the treatment of heterophoria, that is, the giving of tonics and looking after the general welfare of the patient. With these two features of the treatment carried out faithfully, rarely indeed is it necessary to prescribe prisms or to operate on the ocular muscles in any degree of latent insufficiency short of manifest deviation.

DR. HIRAM WOODS, Baltimore: There is a form of esophoria which, in my experience, is usually lessened or modified by refraction correction. Esophoria may be due either to defective action of the externi or overaction of the interni. The average abduction or prism power of the external rectus was given a good many years ago by Noyes as from 5 to 8. He thought when it fell below 5 it indicated a definite weakness of the externus itself; when it was above 5 and less than 8, it indicated a normal external rectus prism power, and over 8, an excessive prism power. I have studied out a good many cases that have been affected by hypermetropic correction. After H refraction is corrected, esophoria has lessened or disappeared entirely, provided the abduction is from 5 to 8 degrees, but it scarcely ever disappears when it is less than that. The explanation of esophoria is that the patient has a defective relative convergence. He cannot separate his convergence from his accommodation; consequently in obtaining vision before his refraction error has been corrected the extra innervation of the ciliary muscle goes also to the internal rectus. Then we have got by the phorometer esophoria, which does not mean external weakness at all, but overaction of the internal recti.

DR. EDWARD JACKSON, Denver: The main fact that stands out from Dr. Zentmayer's study is that for each individual there comes to be established, with approximate permanence, a certain ocular balance; as in each eye finally, in the process of development, a certain relation is established between the length of the anteroposterior axis and the curves of the surfaces. Orthophoria is rare, just as emmetropia is rare, but it is an approximation in that direction. The point is that a relation is established that becomes the fairly permanent condition for that individual. Any person with heterophoria overcomes it by his innervation, and so departs from that permanently established condition of rest. In certain cases there is a more continued departure in the interest of single vision; there may be apparent change in the balance from temporary strain. A patient with presbyopia goes too long without having his glasses changed, and comes to one of us when the near point has gone off to 16 or 20 inches, and he has been straining his accommodation. Frequently in these cases I have found a distinct departure toward esophoria, from the balance I had recorded years before. If the patient, however, gets the correction for the presbyopia and uses it for a few weeks he will come back to the previous state of muscle balance, which may be regarded as the permanent state of balance for that individual. A permanent state of muscle balance is not necessarily congenital, but it is established, perhaps, in rather early childhood, or not entirely until the approach of adult life. I would like to see this subject studied from the point of view of age. My impression is, though I cannot give statistics to support it, that heterophoria is decidedly more influenced in young persons, particularly in young children, by the wearing of corrections for ametropia than it is in adults. I think any such study as Dr. Zentmayer's ought, in future, to consider that, and the cases should be classified according to age. Perhaps that would give us more distinct results.

DR. FRANCIS VALK, New York: Some twenty-five or thirty years ago, at a medical congress in Washington, this subject of esophoria for distance and exophoria for near was discussed, and since that time it has been spoken of in various text-books, but I do not know that any one has explained why we should have homonymous diplopia at 20 feet and crossed diplopia at a shorter distance. I was surprised to hear Dr. Stevenson's report of a patient securing more comfort by holding the book to the right or left. In such cases there must be some tendency for the eyes to turn in a certain direction. I have also noticed that the

text-books, in treating of the rotation of the eye, have decided on a fixed condition of 55 degrees inward and 50 degrees outward. In several cases I have found, in the right eye, a rotation inward of about 45 degrees, and an outward rotation of 55 degrees; in the left eye, 60 degrees inward and only 40 outward. Now if the standard is correct we have here, unquestionably, an exophoria in the right eye taken alone, and esophoria in the left eye taken alone. Now it seems to me reasonable that, when a person looks in the distance, the left eye is esophoric, from the weak outward rotation. In the near the right eye becomes slightly divergent owing to the weak internus and there is exophoria. There is a decided tendency here for both eyes to turn to the right. I think this explains these cases very clearly. All cases of esophoria in the distance and exophoria in the near invariably show this condition. What to do from this point is interesting. We should not put on prisms for distance or for esophoria, nor prisms for exophoria. When esophoria predominates I put a prism over the left eye only base outward and none over the right and it works very successfully. On the other hand, if the exophoria predominates, I put a prism over the right eye with the base in. In some cases I have put the base out over the left eye and base in over the right. These are patients we cannot very well operate on. They do not show a real reason for operating but do show a reason for prisms. Many of you know the term dextrophoria which I have advanced in these cases. My suggestion was not a very good one because it is a combination of Latin and Greek, instead of Greek alone as it ought to be. But the name simply shows the actual tendency of the eyes to rotate in an abnormal condition similar to that of anaphoria.

DR. SAMUEL THEOBALD, Baltimore: One of Dr. Zentmayer's conclusions caused me some surprise; that exophoria for distance and near will be practically unchanged by the correction of compound myopic astigmatism. If the statement had been as to simple myopia I should have unhesitatingly challenged it; but the fact that astigmatism is associated with the myopia is a saving clause. In such circumstances, the effect on the exophoria I should say would depend on whether the myopia was considerable and the astigmatism slight, or the reverse. If the myopia is at all considerable, its correction will surely lessen the exophoria at reading distance. On the other hand, if there is pronounced astigmatism, the relief of the accommodative effect required to overcome this might more than offset the correction of the myopia. With regard to the influence of the correction of anisometropia on the muscle-balance, I have seen some extraordinary results. One case I published in which a marked divergent squint quickly disappeared, under the influence of glasses which equalized the focus of two very dissimilar eyes. Another striking example of the influence of glasses on muscle balance, is shown in cases that Dr. Zentmayer and all of us have seen, cases of convergent squint in which the squint is absent with convex glasses of 3 or 4 diopters but returns at once when the glasses are removed.

DR. GEORGE H. PRICE, Nashville: I am sorry Dr. Zentmayer did not include the testing of the accommodation in the individual prior to the correction of the vision, because on this point, in my opinion, hinges largely the effect which will be produced by the correction of any defect of vision when it is associated with imbalance. Cases in which we have esophoria for distance and exophoria for near and the exophoria increased with lenses, show that if the accommodation is suspended to determine the entire refractive error and a full correcting lens put on without reference to the amount of accommodation the individual had originally, you are apt to meet with the condition that supervenes in the cases reported by Dr. Zentmayer, because you have an overcorrection of the hypertropic condition. This will be a great inconvenience to the patient when he begins to wear the glasses, and if you make a test within a few weeks before the eyes have become adjusted to the new condition, the patient will show a different disturbance in the muscle balance from the original. Put on a correcting lens of a diopter or more and you have relieved the patient of

the necessity of making that much effort at accommodation and the patient feels the lack and the muscle balance sympathizes with it and is disturbed temporarily. Esophoria for distance and near both were reduced; at times exophoria for distance manifested itself after the correction was on. If both are reduced then in the majority of cases you have the proper correction, but if you have carried your correction too far and you take away from the eye the original impulse to which it was accustomed for a long period of time, to bring about the necessary convergence it lags, because it does not get the proper stimulation, then you have a little bit of exophoria.

DR. WILLIAM H. BATES, New York: I take issue with every conclusion that has been made. I believe most of us recognize that myopia is acquired. We have seen cases of astigmatism acquired. Some of them get better and some get worse. Dr. Zentmayer reported that heterophoria changed. I have also observed changes occur in errors of refraction. I believe that the cause of many cases of heterophoria, myopia and astigmatism is psychic. To illustrate: A boy came to me with 4 or 5 diopters of mixed astigmatism under atropin. He never had been able to read more than a few minutes at a time and then only with much headache and pain. His mother (by a method of eye-training which I published) cured his defective sight for distance. Later, after some months without glasses, he became able to read Jaeger No. 1 without any asthenopia, without any apparent exophoria or esophoria and I believe that the cause of the heterophoria and the astigmatism in that boy was psychic.

DR. OTIS ORENDORFF, Canon City, Colo.: From a practical point of view we should consider diseases of the nasal cavity and associated sinuses. But little reference has been made to them. If you will make careful investigation of some of the most perplexing cases with associated phorias you will find numerous cases of nasal disease, and when they are cleared up the phorias will be also cleared up, and you will never be able to do it while the disease exists in the nasal cavities.

DR. MARK D. STEVENSON, Akron, Ohio: A point of interest found by the essayist is that right is more frequent than left hyperphoria. There are many possibilities entering into the explanation of this. It occurs to me that the most likely cause comes in line with what Dr. Jackson has just suggested. Just as good habits in children may assist in correcting deformities, so evil habits of looking may bring about undesirable changes. In a child at a desk sitting in a half-turned position, reading may produce hyperphoria. The difference in the distance between each eye and the reading matter is probably not very important; but the difference in the use and, therefore, in the development of the muscles is likely of great importance and has a real physical basis. For example, in looking much of the time down and to the left, the chief depressor of the right eye is the right superior oblique, and of the left, the left inferior rectus. Therefore, physically, the left inferior rectus will be more developed than the right and in looking at the distance where the muscle balance is usually tested, if desire for fusion is abolished, the more developed muscle will probably exert the greatest influence; and in this case turn the left eye lower which would explain the greater frequency of right hyperphoria. In testing such a patient's hyperphoria when looking to the left, left hyperphoria according to this theory would likely occur on account of the overaction of the hypertrophied right superior oblique. Left hyperphoria could also be explained on the same theory as the causation in those who habitually look downward and to the right. These habits will often vary with the individual and school. As fusion is abolished in the tests, this physical theory seems more plausible than differences in innervation.

DR. WILLIAM ZENTMAYER, Philadelphia: I feel the weakness of the paper. If I had it to do over again, I would ask advice from many confrères, as I did of some in Philadelphia, as to what I should look for and how to go about the analysis. I think one of the points Dr. Jackson made is very strong, that it would have been well to have studied the cases also from the point of age. In a discussion of this

kind much that comes out is based on what I wanted to overcome by my paper. We all have ideas as to the ratio and relations of things, but when we come to analyze our cases we find our preconceived notions were wrong many times. I think some of the discussion proceeds along the line of the notions we have had. Replying to Dr. Valk I would say that last year we had a paper by a member of this Section in which it was declared that, in cases showing esophoria for distance and exophoria for near, the esophoria was a pseudoesophoria due to spasm from excessive effort at convergence to overcome the weak convergence. My cases do not bear out that view. With regard to presbyopia, as Dr. Jackson said, these cases, in time, right themselves, but I think it is better to follow Dr. Stevenson's suggestion and stimulate the convergence by putting on the weakest glass with which the patient can get along. The normal balance is also restored more quickly by prism exercises when the correction of the presbyopia has disturbed the relation between the convergence and the accommodation. As to Dr. Davis's exception to my conclusion that, on the whole, the heterophoria is not greatly influenced by the correction of the ametropia, I would say that perhaps we differ only as to our interpretation of the word "greatly."

Dr. Theobald has spoken of compound myopic astigmatism and the exophoria disappearing under its correction. Had I grouped the cases as to time—months and years—the results might have been different. I think that, probably, is the reason for the total average result being somewhat different from what might be expected from the correction of compound myopic astigmatism.

FUNCTIONAL HEART-BLOCK IN PNEUMONIA

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CASE 1.—N. R., man, aged 70, entered the German Hospital in a semicomatose condition. The only previous history, with any bearing on his present complaint was that he had been ill for several months prior to admission; but neither the nature nor the symptoms of this illness could be determined. On examination he had marked paralysis agitans. The pulse-rate was 36 per minute and regular. The pupils reacted normally to light; the knee-reflexes were absent. There were signs of diffuse bronchitis with suspected areas of consolidation in both lungs; tubercle bacilli were not found in the sputum. The cardiac area appeared normal to percussion; the heart-sounds were indistinct; no murmurs were heard. Abdominal examination revealed nothing abnormal. The radial arteries felt somewhat thickened. There was no edema of the legs. Cheyne-Stokes breathing was absent. The patient was slightly dyspneic and cyanotic and gradually lapsed into complete coma. The pulse remained slow and regular throughout the illness, its rate varied between 34 and 36 per minute. The temperature ranged between 100 and 103 F.; on the day of death, one week after admission, it rose to 105.

Polygraphic tracings were obtained on different days; on one occasion, the radial pulse was 35 and the auricular rate 102 per minute (Fig. 2). There was no numerical ratio between auricular and ventricular contractions, the auricular waves (*a* waves) fell before, immediately after or with the carotid beats (*c* waves); in other words, complete auriculo-ventricular dissociation (complete heart-block) existed. The subcutaneous injection of 1/50 grain of atropin sulphate had no effect on the block (Fig. 3). For purposes of comparison, a normal tracing is shown (Fig. 1) with a normal pulse-rate and the rhythmic progression of *a-c-v* waves in the jugular pulse.

The following notes were abstracted from the post-mortem findings: The brain was slightly congested; its membranes

were normal. On gross section, the spinal cord appeared normal. There were several areas of pneumonic consolidation and evidences of general bronchitis. The gastro-intestinal canal, liver and pancreas were normal. The spleen was somewhat enlarged and congested. The renal capsules were slightly adherent; the organs themselves were congested and showed slight evidences of chronic interstitial changes. There was no lesion of the auriculoventricular bundle,* though it contained a little more connective tissue than is usually found. There was a slight amount of fatty infiltration of the auriculonodal junction, but its dimensions were sufficiently large to carry impulses. There were some moderately large areas of sclerosis in the interventricular septum, but these did not interfere with the continuity of the bundle.

CASE 2.—J. C., man, aged 49, entered the Lebanon Hospital with the typical history of acute pneumonic invasion: One week before admission he had had a severe chill; a day later fever, cough and rusty expectoration developed. On admission, the rectal temperature was 104; there was consolidation of the upper lobe of the left lung; the cardiac area could not be mapped out by percussion; the heart-sounds were distant and scarcely audible; the radial pulse was 120, regular and felt small; the blood-pressure (auscultatory method) was 100 mm. systolic and 60, diastolic. The patient was extremely collapsed and slightly stuporous. On one occasion the urine contained a heavy trace of albumin but no casts. For one week the temperature ranged between 101 and 104; the pulse remained regular. Its rate varied between 108 and 140 per minute, the systolic blood-pressure between 100 and 78 mm., the diastolic between 60 and 0 mm. The temperature then dropped by crisis to 97.5 by rectum. The pulse-rate fell to 88 and was regular. On the ninth day after admission, the ventricular rate suddenly fell to 44 per minute and for four days varied between that and 30. The patient remained in extreme collapse and semistupor with a rectal temperature below 98. The pneumonic area gradually underwent resolution, the radial pulse was very small, there were no visible jugular or carotid pulsations, and the heart-sounds were scarcely audible. There were no general convulsions, but there were frequent attacks of convulsive tremors of the musculature of the upper and lower extremities, which became very cold and cyanosed; the pulse then became very slow and scarcely perceptible and the semistupor changed to deep coma. Each attack lasted about one minute. Two days later the average pulse-rate was 48; the general condition remained the same.

Suddenly on the sixteenth day after admission and one week after the inception of the slow rhythm, there was a marked change in the patient's condition; he sat up in bed, was fully oriented, his color was good, the ventricular rate was 76 per minute and regular, and the heart-sounds though still faint, could be readily heard. There was a soft systolic murmur at the apex. Except on three different occasions, when the pulse-rate fell for a short time to 48, 44 and 40, the rate varied between 60 and 80 and remained regular. Polygraphic tracings were attempted during the period of slow rhythm but were unsatisfactory apparently because of the collapsed arterial and venous circulation. Two weeks later, electrocardiograms which I took showed sequential contractions uninfluenced by pressure on either vagus. The heart-sounds were then normal, the systolic blood-pressure 120 mm., the diastolic 70 mm. Prior to the inception of the slow pulse, 1 ounce each of digalen and the tincture of digitalis had been administered. There was no vomiting throughout the illness.

COMMENT

In Case 1 the history was too meager to approximate the duration of the heart-block prior to the patient's admission to the hospital. From the absence of any organic cause for heart-block in the pathologic examination it is reasonable to assume that pneumonia was the exciting cause of the block. In Case 2, the sudden

drop of pulse-rate and its continued retardation for one week, the frequent slight muscular tremors, the general and circulatory collapse and the sudden resumption of normal pulse-rate leave no doubt as to the presence of heart-block. In the absence of graphic tracings, its nature—complete or incomplete—could not be determined. Since digitalis preparations in large amounts had been given previous to the onset of the block, its action as a possible cause for the latter requires consideration. It has been part of our routine in the treatment of pneumonia to give digitalis preparations by mouth or hypodermically in amounts similar to those administered in this case, but they never reduced the pulse-rate. It is well known that digitalis may produce heart-block. I have seen several cases of endocarditis with broken compensation in which digitalis produced block, but it was not accompanied by collapsed circulation; in fact, decompensation often improved; vomiting usually accompanied the digitalis poisoning. Mackenzie¹ reports a case of cardiac decompensation in which digitalis produced partial heart-block, extrasystoles and alternation; the drug was pushed until the patient vomited; he was very much improved despite these arrhythmias. In my case there was no vomiting; the block came with the crisis; the patient was collapsed and there were slight convulsive tremors. These symptoms continued for one week after digitalis was stopped, and the sudden resumption of normal pulse-rapidity was accompanied by marked beneficial changes in the patient's sensorium and appearance. None of these symptoms resembles digitalis heart-block. It thus appears most probable that though the digitalis may have been a factor in the production of the block, its main cause was the pneumonia.

A sudden drop of pulse-rate to 60 or even 50 per minute with regular ventricular action is not infrequent in pneumonic crises, but such slow rhythms have not been sufficiently studied by graphic methods to determine whether they are true bradycardias (slow sequential auricular and ventricular beats) or are possibly due to heart-block. Hecht² reports a case of influenza in a child in which the electrocardiograms showed heart-block, which still persisted several months after convalescence. Magnus-Alsleben³ reports a case of pneumonia in which digitalis had been given; the temperature fell by lysis; polygraphic tracings apparently show that every third or fourth ventricular beat is blocked. Bachmann⁴ has tabulated all the cases of heart-block reported up to 1912; pneumonia is not mentioned as a causative factor. Mackenzie⁵ states that the invading organism may assail the heart as well as the respiratory tract. Organic changes such as lymphocytic or leukocytic infiltration in or near the junctional tissues, marked myocarditis or cardiac infarct can be excluded, in Case 1 by the pathologic examination, in Case 2 by the sudden inception and relief from block and the other data given.

I have not been able to find any reports in the literature in which pneumonia was accompanied by heart-block with slow ventricular action and with no organic discoverable cause. There is ample evidence that heart-block may exist without any recognizable pathologic change in the cardiac structures; thus, Lewis and

* I am indebted for the report of the examination of serial sections of the heart to Dr. A. E. Cohn of the Hospital of the Rockefeller Institute for Medical Research.

1. Mackenzie: *Heart*, 1910, ii, 359.
2. Hecht: *Ergebn. d. inn. Med. u. Kinderheilk.*, 1913, xi, 393.
3. Magnus-Alsleben: *Ztschr. f. klin. Med.*, 1909-1910, lxi, 85.
4. Bachmann: *Jour. Exper. Med.*, 1912, xvi, 25.
5. Mackenzie: *Diseases of the Heart*, Ed. 2, p. 285.

Mathison⁶ produced it by asphyxia, and Buchanan⁷ showed that it is a physiologic phenomenon in hibernating animals. One may conceive several methods by which a chemical poison like the toxin of pneumonia circulating in the body may produce heart-block: thus, first, by a central effect on the cardio-inhibitory centers in the medulla; second, by profound disturbance of the nutrition or circulation of the general cardiac musculature or its auriculoventricular connections, or third, by an effect on the peripheral intracardiac ganglia and nerves. Our present knowledge of the last is so vague that its discussion would be fruitless. Regarding the first hypothesis, Einthoven⁸ produced varying grades of complete and incomplete block in dogs by morphin injection and conceived it as due to the effect of the drug on the vagus centers in the medulla. In pneumonia the primary danger of circulatory failure is also probably due to central depression of the vasomotor system.⁹ Cardiac failure in the ordinary sense was absent in my cases, there was very slight or no dyspnea, and edema was absent. Though it is impossible to exclude the effect of the toxins on the general and specific cardiac musculature (the second hypothesis) as a causative factor of the block, the symptoms and the dissociation were probably due to toxic depression

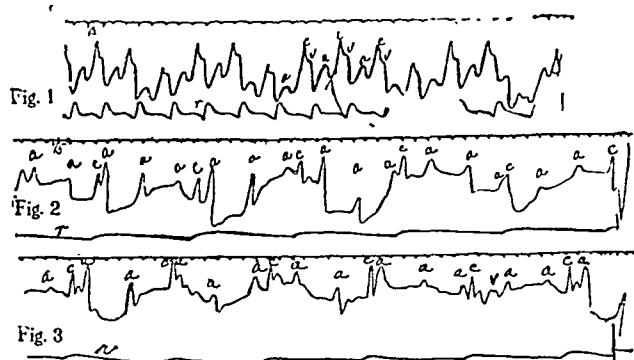


Fig. 1.—Normal polygraphic tracing. Rhythmic progression of a-c-v waves is seen in the venous tracing.

Fig. 2.—Complete heart-block. The auricular beats (a waves) have no sequential relationship to the carotid beats (c waves); they fall before, after or with the carotid beats.

Fig. 3.—Tracing taken after the injection of atropin sulphate, 1/50 grain. Complete heart-block is still present.

In the tracings r=radial beats, a=auricular waves, c=carotid waves. The time-marker indicates 1/5 seconds.

of the cerebral centers and not to any direct action on the heart.

The injection of atropin sulphate in Case 1 did not raise the block. It is usually assumed that the disappearance of arrhythmias after atropin injection is an evidence of their functional nature. The contrary, however, is not true, for other factors, such as drug idiosyncrasies and the continued presence of counteracting poisons (toxins) may prevent or retard the disappearance of functional arrhythmias following atropin injections.

SUMMARY AND CONCLUSIONS

Two cases of heart-block occurring in pneumonia have been described. In the patient who died, the pathologic examination showed no cause for block. Both cases were probably produced by pneumonic toxins which acted on the medullary centers. The

injection of atropin sulphate in Case 1 had no effect on the block.

I am indebted to Dr. J. Kaufmann, attending physician, German Hospital, and to Dr. R. Stein, attending physician, Lebanon Hospital, for the privilege of reporting Cases 1 and 2, respectively; also to Dr. F. B. Humphreys, pathologist, German Hospital, for the post-mortem notes of Case 1.

1275 Madison Avenue.

THE TOXICITY OF CAMPHOR (CAMPHORATED OIL)

D. J. MILTON MILLER, M.D., ATLANTIC CITY, N. J.

In his "Therapeutics" (edition of 1906), H. C. Wood makes the following statement: "Although camphor has, in many cases, produced very alarming symptoms, over 200 grains of it have been taken without permanent result and the recorded fatal poisonings are very few. The only ones known to us are,—adult, quantity unknown; sickly infant, 10 grains; child, 2 years old, quantity unknown; fatal abortion produced by 3 drachms."

On the evening of June 3, M. C., a particularly robust infant of 18 months, weighing 31 pounds, was given, immediately after a full supper of milk and cereal, a brimming teaspoonful of camphorated oil (linimentum camphorae) by mistake. Two hours later I saw the child. It was sleeping quietly and naturally, with cheeks somewhat flushed and the scalp quite wet with perspiration, not an unusual phenomenon with it; the pulse was 110, the respiration 24. When awakened, the infant was found to be quite natural, playing and smiling in its usual manner, and, as nothing abnormal was discovered, nothing was done beyond the administration of 2 drams of castor oil. The child was then replaced in its crib, but was very restless, not falling into a sound sleep until near midnight, a condition which could be attributed as well to its having been disturbed as to the overdose of camphor. The infant awoke the next morning perfectly well, apparently quite unharmed by its unwonted medication.

As camphorated oil is a 20 per cent. solution of camphor in oil, the dose of camphor, given this infant of 18 months, must have been from 14 to 15 grains, the mother having given a brimming teaspoonful (from 1.25 to 1.33 drams); yet there were practically no symptoms.

127 South Illinois Avenue.

Rapid, Painless, Bloodless Method for Removing the Inferior Turbinate.—Nothing especially novel or original is claimed for this operation. It is reported only because of the ease and rapidity with which it is performed and the freedom from adhesions afterward. The primary requisite is an extra long Curtiss nasal trephine (1½ by ¼ inch), a pair of cutting forceps and an elevator for the mucous membrane. The nose is thoroughly anesthetized with crystals of cocain and a 1:1,000 solution of epinephrin. The mucous membrane having been lifted up with elevator over the lower turbinate and all adhesions having been removed, the bone is drilled through lengthwise with the trephine and all projecting edges are removed with cutting forceps. A Bernays compressed sponge which has been first wrapped with paraffin-paper and the ends left exposed is inserted into the nose. The paraffin-paper prevents the sponge from adhering to the wall of the nose, sufficient moisture having been absorbed through the uncovered ends to permit of swelling and at the same time prevents too much pressure on the inflamed surfaces. After three days this tampon is removed. It will be found to be free from blood and at no time either before or after the introduction of the tampon will there be enough blood to discolor a paper napkin. A simple oil spray is ordered and as primary union takes place and as the nasal fossae are widely patulous, no adhesions form.—W. PEYRE PORCHER, M.D., Charleston, S. C.

6. Lewis and Mathison: Heart, 1910, ii, 47.

7. Buchanan: Proc. Phys. Soc., 1911, xlii, 19.

8. Einthoven: Verhandl. Gesellsch. deutsch. Naturforsch. u. Aerzte, 1911.

9. Janeway, T. C.: The Comparative Value of Cardiac Remedies, Arch. Int. Med., March, 1914, p. 378.

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SATURDAY, AUGUST 15, 1914

THE ACTUAL ACIDITY OF HUMAN GASTRIC JUICE

To anyone whose physiologic ideas are rooted in dogmatic or inherited statements it will seem bold to question one of the most wide-spread, sanctioned beliefs of clinical medicine. There is an assertion current in every treatise bearing on the stomach and its disorders that the human gastric juice normally contains about 0.2 per cent. of hydrochloric acid. That the gastric secretion of laboratory animals, the dog for instance, may show a decidedly greater acidity, commonly exceeding 0.5 per cent. of hydrochloric acid, is well appreciated. This discrepancy between the species has frequently received comment and been explained on teleologic grounds. Few persons have stopped to consider that in recent years the gastric juice procured for analysis from dogs has usually been obtained pure, directly through a fistula made for the purpose; whereas the figure accepted by both physiologists and clinicians for the secretion percentage in man was arrived at by examining the contents of the stomach, and not the uncontaminated juice. The bearing of this will appear presently.

There have been suspicions, from time to time, that the accepted figures for the "normal" gastric juice were involved in some uncertainty. The doubts have arisen as a rule among the gastro-enterologists who have occasion daily to decide as to the existence or absence in patients of hyperacidity or hyperchlorhydria. Most of the influential writers have stated that any amount of hydrochloric acid above 0.2 per cent. is to be considered a hyperacidity. On the other hand, cases are repeatedly encountered in which a greater acidity than this figure gives rise to no symptoms of hyperacidity. The situation is complicated by the fact that subjective elements enter into the judgment of the normality or abnormality of the features presented by the human patient. According to competent clinicians, symptoms of hyperacidity may exist even in cases of hypo-acidity. Consequently, those physicians who are willing to disregard the dictates of inflexible rules in diagnosis conclude that the same

amount of acid may indicate a hyperacidity in one person and not in another, showing that individual variations may exist in the so-called normal percentage, and that a sharp line of demarcation cannot always be drawn between the normal and the hyperacid state. This has compelled critical clinicians to refer the symptoms of what is called hyperacidity to a hypersensitiveness of the gastric mucosa toward certain strengths of hydrochloric acid. Ulceration, erosion, atony and sensory neurosis may be factors which serve to correlate certain chemical findings with the sensory disturbances.

Pawlow of St. Petersburg, whose classic researches on the digestive glands won for him one of the early Nobel prizes in medicine, long ago came to the conclusion, on the basis of numerous researches on the pure gastric juice of dogs, that its acidity is essentially constant. The volumes produced may vary widely; not, however, the concentration of hydrochloric acid. There are fluctuations in the course of successive hours and in connection with different types of stimuli, which Pawlow explained as follows: The fluid secreted by the glands proper, which he terms "native" juice, always has a definite acidity. In pouring over the mucous membrane of the stomach this highly acid native juice undergoes a partial neutralization by the alkaline mucus. For this reason juice collected from a fistula may show a somewhat lower acidity during the early period of collection than later. The acidity of the juice actually removed for examination will accordingly depend on the relation of the secretion to the production of gastric mucus and also on the rate of flow. If gastric juice remains for any extended period within the stomach it likewise experiences considerable neutralization. Pawlow argued that in man the native acidity of the secretion of the gastric glands could not differ very much from the high figures (from 0.5 to 0.6 per cent. hydrochloric acid) noted for dogs and cats; and that it must always be constant, because man's food and the construction of his digestive organs are very similar to those of the animals mentioned. Clinicians, however, were not of this opinion.

In recent years, through conditions of accident or disease, a large number of gastric fistulas in human beings have made it easier to obtain pure gastric juice from man. The percentage of hydrochloric acid noted by various observers is sufficiently interesting and significant to be recorded here: Umber (1905), 0.35; Pfaundler (1900), 0.35; Hornberg (1904), 0.48; Goorevitch (1903), 0.37; Moritz (1901), 0.38; Seiler (1901), from 0.32 to 0.44; Verhaegen (1898), 0.48; Sommerfeld (1905), from 0.38 to 0.47; Carlson (1912), from 0.43 to 0.48.

Shall we explain these concordantly high figures obtained in widely separated parts of the world under unlike conditions as consistently due to hyperacidity?

Boldyreff of Kasan, Russia, an investigator favorably known for his contributions to the physiology of digestion, has offered an explanation to reconcile the seemingly contradictory facts in this field.¹ It has been difficult to explain why juice obtained from the entire normal stomach as distinguished from that obtained from experimentally isolated portions of that organ should almost always contain a lower concentration of acid, namely, from 0.1 to 0.2 per cent. of hydrochloric acid, the figures previously quoted. The key, in Boldyreff's judgment, is the observation made by many scientific workers, that the acidity of various acid fluids is reduced during their stay in the stomach. If the stomach always has, for some reason, a tendency to reduce to a definite average the acidity of foreign acid fluids brought into it, it is natural to suppose that either when empty or in those cases in which food material entering it is not capable of such reduction, the stomach similarly reduces the acid juice secreted by its own glands.

Opinion has been divided concerning the mechanism by which the acidity in the stomach is reduced; some attribute it all to the alkaline mucus secreted by the mucous cells of the interior surface of the stomach, others to the pyloric juice, and others to a special secretion supposed to serve the sole purpose of dilution. The saliva and mucus are doubtless minor agents in the partial neutralization of gastric acidity. Boldyreff considers the principal factor concerned to be the pancreatic juice, the strongest alkaline fluid in the body. It has long been known to neutralize the acidity of that portion of the intestinal contents which is next to the stomach; and we are now told that it fulfils the same function within the stomach.

The theses set up by Boldyreff may be summarized as follows:

The acidity of freshly secreted gastric juice is constant (0.5 per cent. hydrochloric acid). This is rapidly lowered to a level which oscillates between 0.15 and 0.2 per cent. The same thing happens after the introduction of any acids foreign to the stomach. This partial neutralization is due to the reflux into the stomach of alkaline juices from the duodenum, the pancreatic juice being here the most important factor. Neutral, alkaline, or feebly acid fluids provoke a secretion of the acid juice in order that the acidity may be brought to the normal level. The mechanism described for maintaining the optimum level of acidity—from 0.15 to 0.2 per cent.—is designated by Boldyreff as the "self-regulation of the acidity of the contents of the stomach." In cases of chronic absence of the pancreatic juice or an insufficient influx thereof into the stomach there is an accommodation whereby the scarcity is made up by an abun-

dant influx of bile and intestinal secretion into the stomach.²

Though it is thus easy to reconcile the divergent results obtained, on the one hand, by clinicians working with gastric contents, and, on the other, by physiologists examining the pure secretion, it is nevertheless not necessary to deny the existence of such a pathologic condition as hyperacidity. All the factors involved should be considered, however, before making a diagnosis. The gastric juice may be perfectly normal and yet show a high acidity, because sufficient time has not elapsed to allow the regulatory partial neutralization to occur; there may be delay in the entrance of intestinal secretions into the stomach, or these may not possess the usual requisite alkalinity. We must seriously consider, therefore, whether the condition described by clinical observers as hyperacidity is not sometimes the expression of a lack of the most important neutralizing fluid, the pancreatic secretion, rather than a pathologic state of the gastric juice. The abnormality can actually be produced in animals by ligating the pancreatic ducts.

A high initial acidity of the gastric juice is advantageous for the destruction of bacteria which find their way into the upper digestive tract. The reduction to a lower degree of acidity has subsequent advantages, among which, obviously, is the prevention of injury to the small intestine. It is another story of wonderful regulatory mechanisms.

THE NUTRIENT VALUE OF INORGANIC SALTS OF LIME AND PHOSPHORIC ACID

The reluctance to admit the nutrient value of some of the inorganic compounds of elements like iron, calcium and phosphorus as compared with "organic" preparations is gradually being overcome. This preference for organic compounds is, we presume, a surviving expression of the old belief that there is an exceptional virtue in products which resemble in some degree the components of the living body. In its earliest phases this view was emphasized by the assumption that a diet of meat was particularly well adapted to the building of muscle; and similarly "organic" iron preparations were somehow looked on as preferable for "blood-building." To-day new experimental research is no longer required to justify the contention that "organic" and inorganic iron are alike available. This conclusion, so firmly fortified by elaborate investigation a decade or more ago, is quite in harmony with the modern studies on the chemical changes taking place in the alimentary tract. There is little doubt that whatever the combination in which they are ingested, iron and calcium and phosphoric acid are in good degree "ionized" by the digestive

1. Boldyreff, W.: The Self-Regulation of the Acidity of the Gastric Contents and the Real Acidity of the Gastric Juice, *Quart. Jour. Exper. Physiol.*, 1914, viii, 1.

2. Boldyreff, W.: Einige neuen Seiten der Tätigkeit der Pankreas, *Ergebn. d. Physiol.*, 1911, xi, 121.

processes; so that even the "organic" preparations in truth result in inorganic derivatives before they are ready for absorption.

Although the problem here set forth is in a sense settled for iron, the utilization of inorganic compounds of lime and phosphoric acid has not been so readily admitted in practice. Experiments on animals demonstrating the conversion of ingested inorganic phosphates into characteristic phosphorized tissue products, like the eggs of birds or the milk of mammals, for example, have not been lacking. But as usual it has been the demonstration of the fact on man that was needed to bring final conviction.

Accordingly, we may welcome the evidence now submitted from the Grossen Friedrichs-Waisenhaus of Berlin by Drs. Schloss and Frank¹ respecting the availability of tricalcic phosphate for the development of bone in growing infants. Elaborate balance experiments on children have shown convincingly the improved retention, not only of the elements represented in this inorganic compound, but also of other metabolic factors such as nitrogen and alkalies in addition, after this inorganic phosphate has been administered in the diet. The improved utilization following the use of tricalcic phosphate was not merely transitory; the advantage accruing therefrom was maintained. We may conclude, therefore, that even in the organism of the growing child so simple a compound as an inorganic salt of calcium can easily be absorbed and advantageously assimilated.

THE AIR OF RAILWAY TUNNELS

The discomfort of travel through smoke-filled railway tunnels is well known, but the question as to the possible effect of the gaseous impurities on the public health has not received the attention which it deserves. The result of such a study has just been published by the Hygienic Laboratory of the United States Public Health Service.² The relative amounts of sulphur dioxide and of carbon monoxide found under ordinary conditions in a typical non-electrified and a typical electrified tunnel (those of the Pennsylvania and the Baltimore and Ohio Railroads at Baltimore) were accurately determined. The results show that on an average there was about five times as much of the two gases in the tunnel through which coal-burning locomotives pass as in the one through which the trains are drawn by electric tractors. It was shown that the amounts of the gases in the non-electrified tunnel are subject to great variations, depending on traffic conditions. The probabilities are that a person will encounter noticeable amounts of sulphur dioxide in four cases out of five and disagreeable or very irritating amounts in two out of every five trips.

The amounts of sulphur dioxide found in the non-electrified tunnel varied from 0.6 to 15.1 parts per million, and the corresponding figures for the electrified tunnel were from 0.3 to 2.9 parts per million. In the case of carbon monoxide the amounts in the non-electrified tunnel varied from 4 to 267 parts per million, and for the electrified tunnel, from 3 to 25 parts per million. In order to ascertain what effects these quantities might have on passengers passing through the tunnels, Seidell and Meserve² reviewed the literature of studies which have so far been made of the action of these gases on animal organisms. It was found that results on minute amounts of the gases are quite meager and the statements concerning their action are in very general terms, so that no really satisfactory idea of the maximum amounts which can be tolerated without injury can be obtained. The question is naturally one which does not lend itself readily to solution. Individual variations and idiosyncrasies will play an important part in any studies which can be made, and interpretation of the results will vary with the point of view of the interested person.

The principal value of the data contained in the bulletin of Seidell and Meserve is to show the actual amounts of the gases present and the reduction in the amounts which can be accomplished through electrification. The question as to whether or not the quantities present are dangerous to health, can be answered only on the basis of extensive physiologic experiments made with similar quantities of the gases. In regard to the discomforts of travel through smoke-filled tunnels there is no question. It does not appear possible at present, however, to affirm that the gaseous impurities in non-electrified railway tunnels are a menace to the public health and therefore justify a demand that the conditions be ameliorated. It seems likely that persons suffering from respiratory or circulatory disturbances may have the condition aggravated by passage through tunnels containing coal-gases, especially sulphur dioxide.

CONGESTIVE AND OTHER CONDITIONS OF MENSTRUATION

The menstrual period has long been regarded as inevitably bringing pain or discomfort and more or less disability to a large number of women at frequent intervals. Experimental investigation relative to menstruation has been largely impossible, so that at best the conclusions on this subject have been based on statistics of various sorts gathered from diverse sources. Comparable functions in the lower animals afford few facts bearing directly on menstrual phenomena noted in the human species. To the minds of those who give attention to the physical degeneration and suffering of an increasing number of women, the question invariably suggests itself, however, whether

1. Schloss, E., and Frank, L.: Tricalciumphosphat als Knochenbildner beim menschlichen Säugling, *Biochem. Ztschr.*, 1914, ix, 372.
2. Seidell, Atherton, and Meserve, Philip W.: Gaseous Impurities in the Air of Railway Tunnels, *Hvg. Lab. Bull.* 92, U. S. P. H. S.

modern conditions of living or dress—factors of personal hygiene—are not responsible for a considerable share of the real or imagined difficulties that have been encountered. Like many other physiologic problems, that of menstruation and its attendant symptoms is so bound up with traditions, inherited prejudices and uncritical personal judgments that the open-minded reviewer is often checked in his attempts to untangle fact from fancy.

Quite recently two contributions¹ have been recorded which should help to eradicate the belief in the inevitable "illness" as the dominating characteristic of menstruation. Dr. Mosher believes that many of the untoward features of functional dysmenorrhea are due to remediable conditions. The periodic physiologic congestion which occurs about the time of menstruation is frequently so excessive that it produces congestive dysmenorrhea. The upright position, lax abdominal muscles, costal instead of diaphragmatic breathing and constriction of the body by clothing which interferes with the use of the diaphragm and abdominal muscles—all combine to develop and promote the excessive pelvic congestion. As a result of such conditions, rather than of any inherent natural organic changes, there may be pain at the menstrual period, prolonged hemorrhage and undue loss of blood. These consequences, Dr. Mosher believes, may be averted by suitable physical therapy.

Despite the widely accepted belief that menstrual disability among women is inevitable, Dr. Mosher insists that under normal conditions there should be no more suffering with disorders of the generative organs than with disturbances of the digestion. She concludes that at present all the evidence points to the menstrual hemorrhage as a secondary matter more or less fixed by the upright position. It is unnecessary and undesirable that it should be of more than brief duration or of more than slight amount. Pain and discomfort, where no organic lesion exists, are readily controllable by the physiologic regulation of the circulation from the abdomen and pelvis back to the heart, by the restoration of the tone and action of the diaphragmatic and abdominal muscles. This is accomplished by suitable bodily exercises. Other coincident functional disturbances, such as congestive headaches, are simultaneously relieved by the "equalizing" of the circulation.

Dr. King has searched with little success for the evidences of rhythm in the organic activities which has so long been emphasized by writers on the subject. Granted that a lowering in pulse-rate, temperature and blood-pressure occur during the menstrual and post-menstrual periods, she asks if much signifi-

cance should, after all, be attached to a diminution in pulse-rate of from two to three beats, to temperature variations rarely greater than 1 degree, and to blood-pressure changes averaging from 2 to 5 mm. Certainly, Dr. King adds, one would suppose that in a healthy individual a normal periodic function should not be accompanied by marked depression of all the life-processes and the generally lowered efficiency so emphasized by numerous writers. If there is a compensation for the loss of blood, it would seem that there should be a compensation in the cardiovascular system. Perhaps this is indicated in the tendency of the blood-pressure to show such slight variations. It has been remarked with regard to menstruation that we have too long confused cause and effect: the menstrual hemorrhage is not the cause of the alleged blood-pressure rhythm, but an exaggerated result of interference with normal circulation. It is generally believed that primitive and savage women have a very scanty menstrual flow. If we may trust the recent contributions on the subject, it would appear that there has been a tendency to overemphasize the inefficiency of women during the menstrual period.

PHYSIOLOGIC SALINE SOLUTIONS

There are numerous occasions in the routine of clinical practice which may call for the use of saline solutions that shall conserve as perfectly as possible the functional or physiologic integrity of the organs and tissue with which they come into contact. The intravenous or subcutaneous infusion of saline may be cited as an instance of this character. Science has learned long since not only that pure water is actually damaging, not to say indifferent, toward living cells, but also that the older so-called physiologic saline, that is, 0.9 per cent. sodium chlorid solution, is not an ideal fluid for contact with tissues. The salts of various elements or ions, such as sodium, potassium, calcium and magnesium, though used in solutions of suitable osmotic pressure, may still individually be decidedly harmful, the toxicity or detrimental character varying with the individual elements involved. On the other hand, the presence of a little of some ion, like calcium, may overcome the harmfulness of another, like sodium.

To Jacques Loeb, who has devoted much energy and so many years of study to the problems here concerned, we owe the conception of a "physiologically balanced" solution. By this is meant one containing salts of such character and in such proportions that any toxicity which the individual components might exhibit by themselves, if they alone were present in solution, is completely compensated and made to disappear. Loeb has emphasized the antagonism of sodium toward potassium and calcium. The underlying facts here involved were incorporated years ago

1. Mosher, Clelia D.: A Physiologic Treatment of Congestive Dysmenorrhea and Kindred Disorders Associated with the Menstrual Function, *THE JOURNAL A. M. A.*, April 25, 1914, p. 1297. King, Jessie L.: Concerning the Periodic Cardiovascular and Temperature Variations in Women, *Am. Jour. Physiol.*, 1914, xxxiv, 203.

by Ringer in the experiments which gave rise to the perfusion fluid bearing his name. Ringer's solution, as is well known, contains a mixture of the chlorids of sodium, potassium and calcium in the proportions of about 0.9, 0.042 and 0.024 per cent., respectively. The details of its composition have been varied by subsequent experimenters in minor respects, by alterations in the relative content of these original components or by further additions, such as alkali carbonate or phosphate. One of the most recent representatives, Tyrode's solution, in which active tissues retain their vitality very well, has the following combination of inorganic ingredients: sodium chlorid, 0.8 per cent.; potassium chlorid, 0.02; calcium chlorid, 0.02; magnesium chlorid, 0.01; sodium phosphate, 0.005; sodium bicarbonate, 0.1.

The test objects which have been employed to ascertain the suitability of the large number of types of "physiologic solutions" have been almost as numerous as the investigators who have dealt with them. Isolated tissue-cells, egg-cells, individual organs like the heart, etc., have served in this capacity. Probably no more sensitive mechanism is to be found than the central nervous system, which speedily loses its irritability and characteristic ability to respond when the fluid medium in which it is bathed fails to suit its needs. For this reason special interest attaches to all investigations conducted with perfusion fluids on the nervous tissues. An unexpected outcome of a very recent study in this field has been the apparent demonstration that the salts of sodium and calcium by themselves provide adequate conditions for the survival of the central nervous system of mammals.¹ According to Gerlach, who developed these facts in Winterstein's physiologic laboratory at Rostock, even minute additions of potassium are objectionable. Calcium and sodium cannot be replaced by other ions. Lithium, for example, was tested in place of the alkali sodium; and the calcium could not be substituted by the related alkali earths barium, strontium or magnesium. Incidentally, the use of calcium-containing solutions in perfusion trials has been observed to prevent or diminish entirely the objectionable formation of tissue edemas, in accord with the contentions of certain physiologists.²

The solution which Gerlach has found most satisfactory for the perfusion of the isolated central nervous system contains 0.9 per cent. sodium chlorid and about 0.05 per cent. dry calcium chlorid. Whether it will prove as suitable for use in human practice as are the "physiologic salines" made up according to current directions, remains to be determined in future experiments. In point of simplicity the new solution

commends itself as worthy of investigation. It may well be that the individual organs—brain, heart, muscles, etc.—differ somewhat in the answer they give to the question of a suitable perfusion fluid. What the clinician primarily seeks is an ideal fluid for infusion into the circulation of the entire body.

MAGNESIUM SALTS, ETHER AND CHLOROFORM

Although the narcotic phenomena produced by the injection of magnesium salts—a procedure introduced by Meltzer and Auer—are now quite familiar, the theories with respect to their behavior have not been in entire accord. It has been noted in animals without exception that a certain dose of magnesium sulphate or magnesium chlorid will produce a deep, often long-lasting anesthesia with complete relaxation of all the voluntary muscles and abolition of some of the more important reflexes. Recovery from such anesthesia is perfect. A larger dose of magnesium salt will produce profound anesthesia and a general paralysis, which, without any preceding or accompanying symptoms of excitation, lead sooner or later to death. The salt invariably effects reduction of excitation or its complete temporary or permanent abolition.

The question has been raised whether or not the symptoms observed represent a true narcosis of central origin or merely a profound paralysis involving the peripheral nervous system. It seems obvious from the fundamental experiments of Meltzer and Auer that complete anesthesia and inhibition of the higher motor centers can be induced by suitable dosage before untoward effects on respiration are evinced. As an indication that the predominant influence is exerted on the central nervous system, Meltzer and Auer showed that, when combined, each in a dose insufficient by itself to produce anesthesia, magnesium salts and ether could initiate that condition without any evidence of peripheral paralysis.¹ The magnesium salt thus appears to supplement the action of a substance which is believed to act on the higher nervous centers. The method involved has been employed successfully in human surgery.²

The problem has been attacked in other ways, one of which is by the use of antagonistic drugs the mode of action of which is precisely known. Camphor, for example, can overcome the effects of agents like paraldehyd or chloral hydrate, which depress the central nervous system; physostigmin antagonizes comparable effects on the peripheral mechanisms. The study of the specific influence of a variety of types of antagonists to narcotic and inhibitory substances might be expected to reveal, by the relative success of each group in

1. Gerlach, P.: Der Einfluss verschiedener Ionen auf das Ueberleben des Zentralnervensystems von Säugetieren, *Biochem. Ztschr.*, 1914, lxi, 125.

2. Chiari and Januschke: Hemmung von Transsudat- und Exsudatbildung durch Calciumsalze, *Wien. klin. Wchnschr.*, 1910, p. 427.

1. The Narcotic Action of Magnesium Salts, editorial, *THE JOURNAL A. M. A.*, Oct. 25, 1913, p. 1544.

2. Meltzer, S. J.: Magnesium und Aether bei Operationen am Menschen, *Zentralbl. f. Physiol.*, 1913, xxvii, 634.

removing the symptoms, the real seat of the action of magnesium salts. This mode of investigation has again been taken up by Starkenstein in the pharmacologic institute of the German University in Prague.³ His conclusion is that it is not possible to designate the so-called magnesium narcosis as either a purely central or purely peripheral paralysis, but that the irritability of all parts of the nervous system is depressed by magnesium ions. Substances which have been supposed to act only peripherally may exhibit a central effect and vice versa. This is quite in harmony with the latest observations of Auer and Meltzer on the effects of ether on the skeletal motor mechanism.⁴ Contrary to the usual statement that ether and chloroform, when inhaled, do not affect the muscles and nerves, these authors find that inhalation of ether exerts an unmistakable influence on the irritability of these tissues. In many experiments involving the direct stimulation of individual groups of muscles and nerves, the depressive effect of the anesthetic was manifest to such a degree that no tetanus at all was obtainable; even the single contraction of the muscles was often nothing more than a short twitch. This depressive manifestation is readily reversible and prompt if the etherization is not too prolonged or dangerously deep. There are distinct differences in the nature of depressive effects between stimulation of nerve or of muscle.

Auer and Meltzer point out that the decreased capacity to produce a tetanus means an increase of fatigability. The greater loss of tetanus with nerve stimulation than with direct stimulation of the muscle under the influence of ether anesthesia means, therefore, that the inhalation of ether causes a greater fatigability in nerve than in muscle. Increased fatigability of the nerve to stimulation means increased resistance to the passage of impulses or increased fatigability of the nerve-endings, since nerve-fibers are not fatigable as a rule. A greater resistance to the passage of impulses in the nerve-ending than in the muscle-tissue is a curare-like action. Magnesium salts have been said to act essentially like curare. Evidently ether, besides its undoubted central effects, has a similar activity.

Some further bearings of these facts have been brought out by these observations that the peripheral motor mechanism may be profoundly affected by ether inhalation. Githens and Meltzer⁵ have obtained evidence that the phrenic nerve and the diaphragm lose a good deal of their irritability in the course of ether anesthesia and that the toxic action on the

peripheral respiratory mechanism begins at an early stage of the etherization. Surprising as it may seem, chloroform, on the other hand, practically does not affect the irritability of motor nerves.⁶ In experiments lasting sometimes six or seven hours the response to a faradic stimulation of the nerve at the end of the period was a tetanus equal to that obtained at the beginning with a similar stimulus. Only when by the prolonged use of a full dose of chloroform the heart became profoundly affected did the irritability of the nerves also become depressed; but this depression is apparently only secondary, due to anemia and asphyxia, and is not a primary effect of chloroform.

Current Comment

THE URINE IN CARCINOMA

The enormous activity which has been aroused in recent years in the study of cancer, stimulated by the contribution of almost unlimited funds, the erection of special institutes and hospitals, and the promise of personal distinction for those who win success, has unfortunately developed some undesirable aspects. No one can deny that there is a formidable and promising array of talent engaged in the solution of the cancer problems. On the other hand it cannot be concealed that there has been an unduly large output of undigested hypotheses. In many fields of science a theory does little harm and often much good, however short-lived it may be, for it either stimulates the investigators to a rigid examination of its contentions or enables them to use it in the critique of their work. But where hypotheses are likely, as in medicine, to find a speedy translation into the terms of practice, a certain degree of intelligent conservatism is usually preferable to the awakening of false hopes based on unjustified premises. To-day we can record another controverted claim emanating from the clinical study of cancer. The urine of man contains a group of chemical substances of unknown origin and indefinite composition, commonly spoken of as the oxyproteic acids. They represent a small fraction of the nitrogenous content of the urine precipitable by special methods of chemical treatment. A few years ago it was announced in contributions from the First Medical Clinic of the University of Vienna that the oxyproteic acid fraction of the urinary nitrogen is decidedly increased in carcinoma, the augmentation being emphasized as a characteristic of the disease. A revision of the subject in von Fürth's laboratory in Vienna has failed to substantiate this.¹ There are cases in which the usual, or normal, content of 4 per cent. is raised to as high as 9 per cent. This occurs only in the cachectic stages of carcinoma and is found in the severe stages of other diseases such as tuberculosis.

3. Starkenstein, E.: Untersuchungen über die Magnesiumnarkose, *Zentralbl. f. Physiol.*, 1914, xxviii, 63.

4. Auer, J., and Meltzer, S. J.: The Effect of Ether Inhalation upon the Skeletal Motor Mechanism, *Proc. Am. Soc. Pharmacol. and Exper. Therap.*, *Jour. Exper. Pharmacol.*, 1914, v, 521.

5. Githens, T. S., and Meltzer, S. J.: The Nature of the Cessation of Respiration in Deep Ether Anesthesia, *Proc. Am. Soc. Pharmacol. and Exper. Therap.*, *Jour. Exper. Pharmacol.*, 1914, v, 523.

6. Githens, T. S., and Meltzer, S. J.: The Irritability of Motor Nerves in Chloroform Anesthesia, *Proc. Am. Soc. Pharmacol. and Exper. Therap.*, *Jour. Exper. Pharmacol.*, 1914, v, 523.

1. Sassa, R.: Ueber die quantitative Bestimmung der Oxyproteinsäurefraktion im normalen und pathologischen Harn, *Biochem. Ztschr.*, 1914, lxi, 195.

It is not a constant phenomenon, but merely an occasional accompaniment of severe cachexia, whatever its antecedent cause may be.

THE WAR AND THE DRUG-SUPPLY

While American life has not been at once affected in any wide-spread dramatic way by the European catastrophe, all sorts and conditions of men are likely to find it touching them at unexpected points. Physicians, for instance, may find that they are hampered in the writing of prescriptions by scarcity of some drug. This country doubtless would suffer little inconvenience beyond the increase in price if compelled to rely on the resources of this continent so far as most inorganic chemicals and biologic preparations are concerned. As for vegetable drugs, however, aside from cascara, hydrastis and podophyllum, few of therapeutic importance are produced in the United States. This country depends largely on European manufacturers for finished preparations and on European middlemen for crude drugs. Crude drugs from the far East, such as buchu, cinchona, senna, asafetida, rhubarb, opium and aloes, come to us largely through the London and Amsterdam markets. A comparatively small amount of cinchona comes from South America, and, if access to the London and Amsterdam markets is shut off, the South American drug might be obtained direct. While the prices for these substances have advanced, the supply should not be altogether cut off by this war unless it should spread to the East and thus limit production. This year's opium crop in southeastern Europe is said to have been greatly damaged by the recent war in the Balkan States and Turkey. Of imported synthetic drugs and alkaloids, by far the largest proportion come from Germany. Ophthalmologists are likely to feel the result of the interruption of trade with Germany in the withdrawal of supplies of physostigmin, pilocarpin, atropin and homatropin. Other important drugs of German manufacture are strychnin, quinin, caffein, cocain, theobromin, formaldehyd and salvarsan. The involvement of France, the chief source of supply of tartaric acid, and of Austria-Hungary, which with France and the Balkan States supplies us with the essential oils, will affect the drug-supply much less than the isolation of Germany.

PRODUCTION OF MEDICINAL SUBSTANCES IN THE UNITED STATES

We have commented above on the effect of the European war on the drug-supply. We may reckon some gain along with the loss if the war leads to a scrutiny with a view to revision of the United States patent laws, which at present favor the importer at the expense of the American public. The patent laws of Great Britain and some other countries provide that the holder of a patent must, under penalty of forfeiture, begin manufacture of the patented product within the country in a reasonable period of time from the issuance of the patent. An American branch of at least one German house had begun the manufacture of a synthetic product before the war. Others

may find it worth while to manufacture on American soil if the war continues; but if our patent laws had contained a provision similar to that of the British law, we would not now be threatened with temporary shortage or stoppage of therapeutic supplies. Our laws, in addition, permit the patenting, not merely of the process, but also of the product. Therefore the American market is altogether dependent for any given patented product on a single foreign manufacturer. Revision of our patent laws may become a necessity if the European war is not over soon. Another result may be an investigation of the possibility of producing in this country a larger proportion of the drugs used here. The Department of Agriculture has long maintained that, so far as soil and climate are concerned, the conditions are favorable for the growing in this country of many of the drug-plants now imported from abroad. In view of the uncertainty whether or not, under practical conditions, the yield could be marketed profitably, cultivators have naturally been somewhat reluctant to experiment with untried crops; but the stimulus of war prices doubtless will induce some growers to make a trial that will demonstrate which drug-plants are commercially profitable.

THE FATE OF CHOLESTEROL IN THE BODY

Now that cholesterol is no longer viewed with indifference with respect to its physiologic rôle, and its possible functions in a variety of phenomena involving the "lipoids" are conceded,¹ the fate of this interesting compound found so widely distributed in animal tissues is brought up for consideration more prominently than ever before. The exceptional resistance of cholesterol to ordinary reagents, its stability, coupled with the lack of knowledge respecting its precise chemical structure, has served to retard the understanding of what happens when cholesterol disappears in the organism. A "balance" of the cholesterol intake, output and storage has never yet been correctly struck in suitable experiments. It appears quite probable that little, if any, cholesterol is ordinarily synthesized anew.² In the light of this situation even tentative hypotheses are acceptable. From this point of view we refer to the recently developed views of Lifschütz³ in Hamburg. He believes that among the diverse physiologic uses of cholesterol is the function of its disintegration products in the migration of fats in the body. According to him the compound takes up an atom of oxygen—presumably in the blood-stream—and is converted into oxysterol, a substance far more reactive than its natural precursor. But beyond this there are other decomposition products which Lifschütz regards as the mother substance for the non-nitrogenous components of the bile acids. Such a sequence of interrelationships has been postulated before, and the burden of proof still remains with those who propose it.

1. Reflections Regarding Cholesterol, editorial, *THE JOURNAL A. M. A.*, Feb. 21, 1914, p. 620.
2. The Conservation of Cholesterol in the Organism, editorial, *THE JOURNAL A. M. A.*, March 30, 1912, p. 941.
3. Lifschütz, J.: Der Abbau des Cholesterins in den tierischen Organen (Studie). VI. Mitteilung. (Cholesterin-Gallensäuren), *Ztschr. f. physiol. Chem.*, 1914, xci. 309.

Medical News

ILLINOIS

Medical Staff Organized.—The medical staff of the Galesburg Hospital at its meeting for organization, August 3, elected Dr. Clarence B. Ripley as chief and Dr. Arthur D. Pollock as secretary of the staff.

Work on Epileptic Colony.—The State Board of Administration has ordered a topographic survey of part of the ground selected for the buildings for the new State Epileptic Colony. This work will take probably two or three weeks.

State Hospital Changes.—Dr. Romney M. Ritchey of the Anna State Hospital has been transferred to the Elgin State Hospital.—Dr. George W. Morrow, acting assistant superintendent at the Anna State Hospital, has been succeeded by Dr. Whedon W. Mercer of the Peoria State Hospital, and has resumed his position as ward physician.

Personal.—Dr. Charles B. Horrell, Galesburg, is reported to be detained in Europe by reason of the war conditions.—Dr. Elmer E. Hagler, Springfield, who was recently operated on for appendicitis, has recovered and resumed his practice.—Dr. Albert Weil, Peoria, is reported to be seriously ill with septicemia at Proctor Hospital, Peoria.—Dr. Catherine B. Slater, Aurora, has gone abroad.—Dr. E. W. Fell of the staff of the Elgin State Hospital has resigned to become a member of the staff of the Ransom Sanitarium, Rockford.—Dr. Frederick W. Werner, Joliet, who has been seriously ill with septicemia at Silver Cross Hospital, suffered amputation of his right foot August 11.

Chicago

Personal.—Drs. E. Wyllys Andrews, John B. Murphy, Howard O. Shafer, Harry M. Richter, J. Rawson Pennington and Paul Oliver returned from Europe last week.—Dr. James W. Jobling, formerly pathologist of the Michael Reese Hospital, has been appointed professor of pathology in the Vanderbilt University, Nashville, Tenn.—Dr. George W. Dunlap has sailed for Europe.

Physicians Held in Europe.—Among the Chicago practitioners who are held in Europe by reason of the difficulty in obtaining transportation on account of the war are the following: Donald P. Abbott, Russell M. Wilder, Maurice Pincoffs, Vernon C. David, Charles Davison, Nelson M. Percy, William Fuller, Otto H. Rohrlack, Adolph Hartung, George W. Post, Jr., Winfield Scott Hall, Adolphus E. Bertling, Maximilian Herzog, Kasimir A. Zurawski, George Paul Marquis, Thomas J. Watkins, Norval H. Pierce, Cassius D. Wescott, Junius C. Hoag, Casey A. Wood, Isaac A. Abt, Ira Frank, Samuel Salinger, Adolf Decker, Walter H. Allport, John A. Stahl, Calvin W. Harrison, Frank A. Stahl, Charles H. Solomon, Robert S. Denney, Harry R. Wormley, Emilius C. Dudley, Franklin H. Martin, David Monash, Ernest Saurenhaus, F. Curt Harnisch, Leo M. Czaja, Truman W. Brophy, R. D. MacArthur, Charles M. Robertson, Allan B. Kanavel, Willis O. Nance, Henry R. Smith and Carl Langer.

IOWA

Sanatorium Opened.—The Scott County Tuberculosis Hospital was opened recently with simple ceremonies. The institution represents an investment of \$75,000.

Personal.—Dr. Campbell P. Howard, Iowa City, has been elected vice-president of the American Society for Clinical Research.—Dr. John E. Brinkman, Waterloo, has gone abroad.

Health Officers Given More Power.—The State Board of Health on July 9 adopted a rule regarding quarantine for contagious diseases which gives health officers absolute power in the conducting and handling of these cases.

Work of State Bacteriologist.—During the biennium ending July 1, 1914, the State Board of Health Bacteriologic Laboratory has made 35,433 examinations. About 17,000 of these were for diphtheria, 7,000 for tuberculosis and 4,000 for typhoid fever.

New Officers.—Iowa University Medical Society at Cedar Rapids, July 14: president, Dr. Henry J. Prentiss, Iowa City.—Harrison County Medical Association at Logan: president, Dr. John Tamsiea, Missouri Valley; secretary, Dr. Hans Hansen, Logan.

Workingmen's Compensation Act.—Dr. Wilbur S. Conkling, Des Moines, representing the Polk County Medical

Society, recently conferred with Warren Garst of the Industrial Commission with regard to the cooperation of the state in making the Workingmen's Compensation Act a success.

Hospital Notes.—The Isolation Hospital at Clinton was opened for patients last week. Four beds are provided for patients suffering from quarantinable diseases, and more accommodations will be provided when the upper floor of the building is completed.—Johnson County Medical Society has appointed a committee to secure signatures for the petition for a new hospital for Johnson County. It is proposed to erect a building to cost between \$40,000 and \$50,000.

MARYLAND

Hospital in Hands of Receiver.—Arlington Rest, a sanatorium and private hospital at Arlington, Md., which has been conducted by Dr. Chauncey T. Scudder, has been placed in the hands of a receiver. Dr. Scudder is said to have left the city four weeks ago, thus leaving the institution without an executive head or the advice of a medical expert.

Personal.—Dr. Randolph Winslow and Dr. Walter F. Sowers, Baltimore, have sailed for Europe.—Dr. William C. Stone, Ellicott City, health officer of Howard County, has resigned on his appointment as deputy health warden.—Dr. W. L. Moss, assistant resident physician at Johns Hopkins Hospital, and in charge of the tuberculosis laboratory, has been appointed internist of the Buffalo State Institute for the Investigation of Malignant Diseases, Buffalo, N. Y.—Dr. Thomas F. Keating, Baltimore, has been appointed assistant surgeon in the United States Public Health Service.—Dr. Felix Landois, Johns Hopkins Hospital, captain in the German army medical corps, has been recalled to Germany.

Baltimore

The Fresh-Air Fund.—The Baltimore News Fresh-Air Fund had passed \$7,000 on July 31 and should reach the \$10,000 desired before the end of the season. This fund is for the benevolent activities of the fresh-air farm at Fallston.

State to Help Support Laboratory.—The state of Maryland has agreed to help support the bacteriologic laboratory of the Baltimore Health Department and also to pay the city \$500 rental for accommodation in the new quarters of the Health Department.

President Remsen on Round-the-World Trip.—Dr. Ira Remsen left Baltimore July 16 on a tour around the world by way of the west. He will attend the meeting of the British Association for the Advancement of Science in August and various scientific meetings to be held in New Zealand early in September.

MISSOURI

New Members of Health Board.—The Governor has appointed Dr. Marc Ray Hughes, St. Louis, a member of the State Board of Health to succeed Dr. Ira W. Upshaw, St. Louis, term expired. Dr. T. A. Son, Bonne Terre, to succeed Dr. G. D. Schulz, Cape Girardeau, term expired, and Dr. T. H. Wilcoxon, Bowling Green, to succeed himself.

Home for the Aged.—An anonymous benefactor has donated a home for the aged in Kansas City, and the old Fowler home at Independence and Mt. Gault Avenues has been selected as a site. The house has been remodeled and will contain seventeen rooms in addition to the servants quarters. Four buildings are also to be erected, each of which will contain four modern apartments for aged couples. The institution is to be known as the Kansas City Home for the Aged, and Dr. E. L. Mathias is secretary.

Personal.—Dr. E. S. Carnell, Kansas City, has arrived in London from Vienna, and is awaiting transportation to this country.—Dr. J. C. Humphries, Laredo, is reported to be seriously ill with kidney disease at the hospital in Trenton.—Dr. David Gordon, Chillicothe, was dangerously injured by the overturning of his buggy July 31, in a washout when returning from a personal call.—Janet Reid has been appointed medical director of the Deming Tent Cottage, Deming, N. Mex.—Dr. J. M. Singleton, Kansas City, is reported to be critically ill with heart disease at his farm near Leeds.

NEW JERSEY

Personal.—Dr. Richard H. Dieffenbach has resigned as a member of the Board of Health of Newark.—Dr. George B. Verbeck has resigned as resident physician at the Mountainside Hospital, Montclair.—Dr. Margaret N. Sullivan,

Jersey City, has been placed in charge of the women's ward at the Jersey City Hospital.

State Society Meeting.—At the one hundred and forty-eighth annual meeting of the Medical Society of New Jersey held at Spring Lake, the following officers were elected: president, Frank D. Gray, Jersey City; vice-presidents, Dr. William J. Chandler, South Orange; Dr. Philip Marvel, Atlantic City, and Dr. William G. Schaufliker, Lakewood; recording secretary, Dr. Thomas N. Gray, East Orange (reelected); corresponding secretary, Dr. Harry A. Stout, Winona (reelected), and treasurer, Dr. Archibald Mercer, Newark (reelected). The 1915 meeting will be held in Spring Lake.

Hospital Notes.—The contract for the new medical building for the Mountainside Hospital, Montclair, was awarded July 23. The building will cost about \$100,000.—The former home of Theophilus Zerbrugg, Riverside, who left a half million dollars to found a memorial hospital, has been purchased and remodeled and is to be used as a foundation of the new institution.—Dr. Edward Guion, health officer of Atlantic City, has proposed to Atlantic City the establishment of a tented village for tuberculosis patients on the county farm at Smith's Landing.—The freeholders of Camden County and the county tuberculosis commission inspected the new county tubercular hospital at Ancora. The property includes 81 acres of land on which a sanatorium formerly stood. The building has been remodeled at a cost of \$50,000, and now has accommodations for 100 patients.

NEW YORK

New Officers.—New York Medical Alumni Association of the University of Maryland, fifth annual reunion at Syracuse, July 30: president, Dr. Emory W. Carr, Lyons; secretary-treasurer, Dr. DeLancey F. Bartlett, Fayetteville.

Hospital Surgeons Meet.—The newly organized Hospital Surgeons' Association of Kings County met in Brooklyn, July 21, adopted a constitution and by-laws, and appointed an executive committee consisting of a representative from each hospital to serve for the ensuing year.

Physicians and Casualty Companies Agree.—After a series of conferences between representatives of casualty companies and of the Medical Society of the State of New York, a fixed schedule of charges for service to injured employees under the new compensation law has been agreed on.

Petition for Hospital.—A petition, containing the names of eighty physicians of Steuben County, has been filed with the clerk of the county board of supervisors, asking an appropriation for the purchase of a site for a county tuberculosis sanatorium and for the erection of buildings for the institution.

Austria to Get Serum Here.—Dr. Sigismund S. Goldwater, health commissioner, has received a cablegram from the Serum Institute of Vienna requesting the immediate delivery of 50 liters of tetanus serum for the use of wounded Austrian and Hungarian soldiers. The laboratories of Otisville will furnish the serum.

Aid in Cancer Diagnosis.—The State Institute for the Study of Malignant Disease at Buffalo, N. Y., is prepared to cooperate with physicians throughout the state to undertake to make the diagnosis of all cancer cases throughout the state and states that it will be glad to diagnose all cases from the city of New York sent to the institute. They are desirous that the physicians of the state and of New York City should be made aware of this opportunity.

New Nursing Periodical.—The *Nurse*, announced as "a magazine of scientific nursing instruction and nursing literature," is to be issued monthly by the Nurse Publishing Company, Jamestown, N. Y. The terms are \$2 a year in the United States and dependencies, Mexico and Canada, and \$3 in other countries in the postal union. The first issue (July) consists of 82 pages containing, among other articles, papers on "The Tuberculosis Nurse and the Tuberculosis Problem," by S. A. Knopf; "The Nursing Missicnary," by Bishop W. A. Sellew; "Charity Nursing in a Tenement," "Nursing Method" and "Diet in Sickness and in Health."

Medical Control of Day Nurseries.—At the request of the Department of Health, the committee on public health, hospitals and budget of the New York Academy of Medicine discussed the problem of vaginitis in children as related to public schools, hospitals, day nurseries and other institutions last spring. Following this a committee was appointed to submit recommendations among which were the following:

That those in charge of day nurseries should be informed of the great danger of infection and taught what precautions are necessary; that systematic examination of babies in day nurseries be undertaken by the Health Department to determine the frequency of infection and the measures necessary to diminish it. This matter has been carefully considered by the Health Department and a set of rules for day nurseries in the city of New York have been prepared which provide that each day nursery shall have attached thereto a regular physician of its selection, duly licensed under the laws of the state, and in good professional standing. The set of rules for the guidance of the medical officer calls for the examination of every child before admission to a nursery and for the regular examination of every inmate of a nursery every alternate week. A set of rules governing the matrons of day nurseries has also been provided.

New York City

Hospital Incorporated.—Twenty-two physicians of South Brooklyn have incorporated the Harbor Hospital for the treatment of indigent patients, or those who are able to pay only small fees for hospital care. The institution is housed in a four-story building on Fourth Avenue, and three of the four wards are now ready for occupancy.

Personal.—Dr. William M. Polk has returned from Europe.—Dr. Lewis A. Sexton, resident physician at the Reception Hospital, has resigned to become assistant superintendent of the Johns Hopkins Hospital, Baltimore.—Dr. William S. Irwin, for many years surgeon on the United Fruit Company steamers, has resigned from the service.—The order of St. Sava has been conferred on Dr. Benjamin Jablons by King Peter of Servia.

Extends Campaign for Better Babies.—The New York milk committee is sending a post-card to health officers all over the country telling how the city is working for better babies. The card states that during the past seven years New York City has cut her infant death-rate more than 30 per cent. and that it is actually a safer city for babies to be born in than any other of the ten largest cities of the country. The card states further that no city with an infant death-rate around the 100 mark can afford to be satisfied. The work of the "Better Baby Week" is described, telling how business men were enlisted and financial support secured. The slogan adopted was "Better Babies, Better Mothers, Better City." The card closes with the question, "What is Your City Doing to Advertise 'Better Babies'?"

OHIO

Campaign against Loafers and Spitters.—Chief Wyman of the police department, and Safety Director Vodrey have started a campaign in East Liverpool against loitering and spitting on the sidewalks.

Hospital for Sick Babies.—The Youngstown Visiting Nurse Association has opened a hospital for sick babies, near the Fresh Air Camp in Mill Creek Park with Miss Wallace and Miss Headlings in charge.

Public Health Nurses in Kenton and Findlay.—The joint tuberculosis hospital board of Champaign, Clark, Madison and Greene counties have voted \$1,200 a year for the employment of a public health nurse.

Campaign against Privies.—Dr. Arthur L. Jones, health officer of Lima, has started an active campaign against the thousand odd outhouses in that city. Either such outhouses must be improved to conform to the law or they will be condemned by the board of health.

Many Seals Sold in Ohio.—According to the report of the National Association for the Study and Prevention of Tuberculosis more than 44,000,000 Red Cross Christmas Seals were sold during the recent campaign in the United States. Of these 2,838,892 were sold in Ohio, placing this state second in rank to New York.

State Supervising Nurse.—Miss Margaret Kameron, R. N., state supervising nurse in the Division of Public Health Education and Tuberculosis of the State Board of Health, resigned July 1, after having been identified with the state work for the past two years. When the Ohio Society for the Prevention of Tuberculosis started its first Red Cross Seal Contest in 1911, offering the services of a nurse for one month to each of the twelve cities selling the largest number of seals per capita, Miss Kameron was the nurse chosen to institute the work. Miss Kameron plans to rest through the summer and then intends to take a special course at the Teachers' College, Columbia University.

OKLAHOMA

Still in Europe.—Dr. A. M. Young and Dr. and Mrs. R. M. Howard, Oklahoma City; Dr. and Mrs. W. E. Wright, Tulsa, are marooned abroad.

School for Blind Opened.—Oklahoma State School for the Blind, Muskogee, erected at cost of \$100,000 is now open and 150 students have been enrolled.

Personal.—Dr. W. S. Cary, Rankin, was seriously injured in an automobile accident recently.—Dr. A. L. Walters, Checotah, who was operated on a short time ago for appendicitis is convalescent.—Dr. John H. Barr, Reed, suffered amputation of a limb as the result of an accidental gun-shot wound.

PENNSYLVANIA

Personal.—Dr. Nathaniel S. Yawger has been appointed assistant to Dr. William G. Spiller, chief neurologist to the Philadelphia General Hospital.

New Officers.—Fifth District Medical Society at Brookside Park, York, July 29: president, Dr. William E. Wolff, Arendtsville; secretary-treasurer, Dr. Charles W. Eisenhower, York.

Media's Pure Milk Campaign.—The Woman's Club of Media has started a vigorous campaign to insure pure milk to that town and surroundings. This organization has already provided a visiting nurse for the community.

New Building for State Hospital.—During the next year there will be constructed at Rittersville State Hospital a building for male patients, one for male nurses and an isolation hospital for patients suffering from tuberculosis.

Pennsylvania Relief Fund.—At the semi-annual meeting of the Pennsylvania Railroad Voluntary Relief Association it was reported that during the last fiscal year the fund disbursed \$2,520,847.22. The receipts during the same period were a total of \$2,628,542.66. The fund had total assets of \$2,911,494.93.

Marooned in Europe.—Among the physicians and teachers marooned in Europe are: Provost Edgar F. Smith of the University of Pennsylvania, Edward Robbins, secretary of the Board of Trustees of the University; Drs. E. E. Montgomery, Howard Hansel, William M. Sweet, James M. Anders and William Rodman.

Personal.—Dr. Stacy H. Rinehardt, a member of the staff of the State Tuberculosis Sanitarium, Cresson, has resigned and will practice in Pittsburgh.—Dr. A. H. Bernstein, East Scranton, is detained in Germany by reason of war conditions.—Dr. Benjamin F. Bartho, Mt. Carmel, was operated on for appendicitis at Fountain Springs Hospital, July 31, and is reported to be doing well.—Dr. Harry B. Stryker, Reading, is under treatment in his private hospital for septicemia, and is reported to be improving.—Dr. William J. O'Malley, West Scranton, has started for Columbia, S. A., where he is to be superintendent of the hospital operated by a large copper mining company.—Dr. Joseph C. Doane, superintendent of the Miners' Hospital at Shamokin, has been appointed chief resident physician at Philadelphia General Hospital.

Philadelphia

Baugh Institute of Anatomy to Be Extended.—Mr. Daniel Baugh, the founder and patron of the Baugh Institute, has purchased and added to his original gift, the premises 236 and 238 Pine Street, as an addition to the school, and has given \$5,000 for the improvement and equipment.

More Baby Farms Discovered.—Following the death of three children in an unlicensed baby farm several weeks ago, three other such places have been discovered, where the houses are filthy and the milk was found to contain large quantities of laudanum. The three proprietors, all colored women, were given a hearing before Magistrate Boyle, August 6.

Carnival of Safety.—Safety day will be celebrated by the churches, September 20-27, by the public schools September 23. Carnival Day exercises will be held in Convention Hall, September 26, and the Convention of Safety will meet at Convention Hall, September 26 to 29. The city has taken space for its exhibit; the Pennsylvania Railroad and the Baltimore and Ohio Railroad and the Corporations Utilities Companies are all cooperating.

WISCONSIN

Contracts Awarded for Sanatorium.—Contracts amounting to \$122,720 were let by the Milwaukee County Board, July 31, for work on the Wauwatosa Tuberculosis Sanitarium.

Prosecution for Use of Red Cross.—On the charge of violating the law referring to the use of the Red Cross emblem, fourteen Milwaukee physicians, representatives of railroads, undertakers and liverymen were arraigned in the federal court, July 30. The case has been set for trial on the first Monday in September.

Child-Welfare Staff Appointed.—Health Commissioner George C. Ruhland of Milwaukee has appointed the following staff for the child-welfare health stations: Waluka Park Pavilion, Drs. George Taylor, Frederick Gray, Albert W. Myers, Charles H. Stoddard and Thomas R. Bours; Lapham Park, Drs. George H. Fellman and Clarence F. Hardy; Kosciusko Park, Drs. John N. Rock and Henry J. Gramling.

Health Commissioner Upheld by County Society.—At a meeting of the Milwaukee County Medical Society, July 11, resolutions were adopted urging that the "city government should uphold the commissioner of health in his demand that the ordinance with regard to the test for tuberculosis in cows forming herds that are any part of the milk-supply of the city of Milwaukee, be drawn."

Personal.—Dr. Mazyck P. Ravenel, formerly professor of bacteriology at the Wisconsin State University, director of the state hygienic laboratories, has been appointed a member of the advisory board of the hygienic laboratory of the United States Public Health Service, Washington. Dr. Ravenel ended his duties at Madison, July 1, and has accepted the position of professor of preventive medicine and bacteriology at the public health laboratory of the University of Missouri.—Dr. Thomas F. Thompson has been appointed chief of the sanitary inspection force of the Health Department of Milwaukee.

GENERAL

Railway Surgeons to Meet.—The annual convention of the surgeons of the Rhode Island System will be held in Des Moines, Ia., the first week in September.

Coming Meeting of Ohio Valley Physicians.—The annual meeting of the Ohio Valley Medical Association is announced to be held in Evansville, Ind., November 4 and 5.

Polish Physicians to Meet.—The fourth annual meeting of Polish physicians will be held at Buffalo, N. Y., September 7, under the presidency of Dr. Francis E. Fronczak.

Health Examiners to Meet in Florida.—The annual meeting of the American Public Health Association will be held in Jacksonville, Fla., December 1 to 5, inclusive. The two principal symposiums will be on negro health, and rural health organization and sanitation.

Interstate Society Meeting.—At the annual meeting of the Austin Flint-Cedar Valley Medical Society, held in Cedar Rapids, July 15, the following officers were elected: president, Dr. George Kessel, Cresco, Iowa; vice-president, Dr. Thomas U. McManus, Waterloo, Iowa; secretary, Dr. Charles F. Starr, Mason City, Iowa (reelected), and treasurer, Dr. Will L. Hearst, Cedar Falls, Iowa (reelected). Waverly, Iowa, was selected as the place of meeting for 1915.

The American Red Cross in European War.—At a joint meeting of the International and War Relief boards of the American Red Cross held in Washington, August 5, it was decided formally to tender the services of the society to the warring nations, and plans were initiated for the immediate issuance of appeals for relief funds and for placing medical officers and nurses trained for the work at the disposal of the forces. Announcement has been made that a fully equipped hospital ship carrying physicians, nurses and medical supplies will be sent to Europe, sailing under the Red Cross flag and under protection of the Geneva Convention and Hague Treaties.

Subscription Swindler at Work.—Attention is called to the operation of a swindler who recently has been operating among doctors and dentists, soliciting subscriptions for which he is not authorized. His offers concern generally a combined subscription to *The Literary Digest* and such medical publications as a dictionary, medical clinics and other medical works. Numerous aliases are used in signing receipts. He is described as about 21 years old, 6 feet tall, weighing about 180 pounds. Has black hair, very dark and large black eyes, a deep falsetto voice, and somewhat pale skin. A reward of \$25 has been offered for his arrest. Communications should be sent to the Periodical Publishers' Association, 156 Fifth Avenue, New York City.

The Plague Situation.—Since the report made in THE JOURNAL of August 1, one more case of human plague has been reported in New Orleans. This fourteenth case was a

car cleaner 22 years of age, male, employed at the Louisville and Nashville shops at Girod and Front streets, who was taken ill July 29, with femoral bubo. There have also been discovered eleven additional cases of plague-infected rats, making thirty-two in all. On July 25 the Board of Health of New Orleans, on recommendation of the United States Public Health Service, adopted four ordinances having for their object the prevention of plague in the city and its eradication from infected foci. The first of these ordinances relates to the keeping of fowls and small animals, and provides that such animals can be kept only in rat-proof buildings. The effect of this ordinance is to keep rats away from food given to or left by these animals, thus removing one of the usual sources of food-supply of rats and mice. It also protects pet animals from infected fleas. The second ordinance relates to the position of vessels and water craft of all description at docks and wharves, and the method of loading and unloading; provides that no water craft shall be nearer than 8 feet from any dock or wharf; that all hawsers, chains or lines of any kind be equipped with rat shields or guards approved by the health officer of the city; that gang-plank, staging or other structures intended for loading or unloading, and by which rats might pass between wharves and vessels must not be left down except during actual loading or unloading, and that at these times there must be a guard at each gang-plank or staging to watch for rats and prevent them going to or from the vessels. When it is necessary to load or unload at night in addition to the guard at each gang-plank or staging, proper and sufficient lights must be furnished and the gang-planks must be whitened for a space of 10 feet. Crated cargo or empty barrels or boxes are not to be loaded or unloaded until inspection has shown that they are free from rats. The third ordinance provides that every building, outhouse and other superstructure now erected or hereafter to be erected at New Orleans shall be rat proofed in the manner given in detail in the ordinance. The fourth ordinance provides that the owner, agent and occupant of all premises improved or unimproved in New Orleans shall provide metal, water-tight containers with tight-fitting covers in numbers sufficient to receive the garbage accumulation of forty-eight hours from such premises. The object of the ordinance is to keep the garbage from serving as food for rats. All garbage must be kept in the prescribed garbage containers.—The Iowa State Board of Health through its secretary, Dr. W. L. Biering, Des Moines, has started a campaign against rats and other rodents, in order to reduce to the minimum the risk of bubonic plague.—P. A. Surg. J. M. Gillespie, U. S. P. H. S., has been ordered to New Orleans and has been assigned to the charge of the fifth sanitary district which embraces the territory bounded by Elysian Fields Avenue to Jordan Avenue, and North Claiborne Avenue to the river.

CANAL ZONE

Personal.—Surgeon James C. Perry, U. S. P. H. S., has resigned as chief quarantine officer, and has been granted a leave of absence of a year, which he will spend in traveling.—Major Thomas L. Rhodes, M. C., U. S. A., has been transferred to the Panama Canal service, and has been appointed superintendent of the Colon Hospital.

Better Accommodations at Detention Stations.—The two-story building at the east end of the Colon Hospital, formerly occupied by officers, has been turned over to quarantine service as a detention station for the first-class passengers. The building contains forty rooms in addition to a large dining-room. The old detention station will be continued to be used for steerage passengers.

Private Hospitals.—The chief health officer of the Canal Zone issued on July 9 a circular setting forth that as a maintenance of private hospitals in the cities of Panama and Colon interferes seriously with the supervision and control of the department of health over sanitary matters, it is ordered that no private hospitals shall be established or maintained in the cities of Panama and Colon; any such hospitals being conducted in these cities shall be discontinued. Any one, who as a physician, owner or person in charge of any private hospital in the cities of Panama or Colon, shall establish or maintain any such hospital after the prorogation of this order should be fined a sum of not exceeding \$500 for each day after the continuance of such hospital.

Morbidity and Mortality for June.—The chief officer of the Canal Zone reports that during June the admission to hos-

pitals and quarters was 1,511 or a rate of 381.09 per 1,000 per annum, as compared with 407.92 for the preceding month, and 472.50 for the corresponding month of 1913. The total number of deaths was 20 and of these 13 were due to disease. Two deaths were due to lobular pneumonia, organic diseases of the heart and tuberculosis. The disease causing the most admission and non-effective rates in hospitals was malaria with 62 per 1,000 per annum. The next highest admission rates in order were for venereal, digestive and respiratory diseases. These four classes of diseases caused 51 per cent. of all admissions. The admission rate to hospital and death-rate for black employees were 139.79 and 3.67 for 1,000 per annum as compared with 350.66 and 1.43 for white employees. The non-effective rate disease and injuries for black employees was 10-20 per 1,000 as compared with 18-67 for white employees, and the admission rate for hospitals for malaria was 53.23 per 1,000 per annum for blacks as compared with 143.37 for whites.

FOREIGN

War Interferes with International Congresses.—Among the international congresses that were to have been held in Europe this summer and fall are the congress on medical electrolgy and radiology, Lyons, July 27; on ophthalmology, St. Petersburg, July 28; conference on tuberculosis, Berne, September 2; the International League against Epilepsy, Berne, September 5; on neurology, psychology and psychiatry, Berne, September 7; the congress on criminal anthropology, Budapest, September 14; on occupational diseases, Vienna, September 21, and the congress of International Association for Sexual Research, Berlin, October 31.

Clashing International Congresses.—The propaganda committee in charge of the International Medical Congress, planned to be held at Munich in 1917, has issued an appeal to other scientific organizations begging them to arrange their meetings so as to leave that date open for the above international gathering. As at present planned, the International Surgical Association is to hold its fifth meeting at Paris in 1917, and numerous national annual meetings are arranged for that year in Germany and elsewhere. In order to prevent this dissipation of forces the committee urges other organizations to postpone their annual meetings that year and gather at the International Medical Congress, particularly as "radiotherapy of tumors," "biologic reactions," "diagnosis and treatment of tetanus," and "thrombosis," which are the subjects appointed for discussion at the Surgical Congress are all of special interest to internists as well. The committee says that it would be still better for the above organizations to hold their meetings as sections of the great medical gathering. This is what the anatomists have already decided on; the International Congress on Anatomy has been affiliated with the International Medical Congress as a section of the same. As the International Surgical Association meets every three years and the Medical every four years, once in twelve years they will clash. The appeal is signed by J. F. Lehmann, the well-known publisher of medical works, chairman of the propaganda committee.

CANADA

Association Meetings.—The Alberta Medical Association at its recent annual meeting elected Dr. Robert G. Brett, Banff, president, and Dr. J. G. Clark, Calgary, secretary-treasurer. Next year's convention will be held in Banff.—The Canadian Public Health Association promises to have a very successful convention at Port Arthur and Fort William, September 10 to 12.

Personals.—Among Canadian doctors caught in Europe when war was declared are: Mr Irving H. Cameron, William P. Caven, Duncan N. MacLennan, Richard A. Reeve of Toronto. Dr. A. Orr Hastings, Toronto, was successful in returning on the *Olympic*. There are still a large number of Canadians of the medical profession still on continental Europe as well as in England unable to return to their native land. Several have offered to serve in the British army.—Dr. Harvey Clare, assistant superintendent of the Toronto Hospital for the Insane, has been appointed medical director of the new Detention Hospital just opened in Toronto.—Dr. Keith Simon has been appointed pathologist to Grace Hospital, Toronto.—Dr. Walter S. Bloom, Kingston, has been appointed professor of biologic chemistry at Harvard University.—Dr. George S. Ryerson, Toronto, has been made an Honorary Chief of the Six Nations Indians with the name of Ra-de-ri-yoho—"Man-Who-Fights-His-

Way."—Dr. O. C. Gruner, assistant professor of pathology at McGill University, Montreal, has resigned and returned to England.

Manitoba Sanatorium for Consumptives.—The third annual report of the above institution includes the annual report for the year 1913 as well as the financial report for the year ending March 31, 1914. In February an infirmary building was opened with capacity for 27 patients. The full capacity of the institution is now 118, nearly twice of that when it was opened in 1910. In 1911 the patients admitted were 168; in 1912, 189; and in 1913, 232. This sanatorium aims to provide for the care of incipient cases for the whole province, leaving the advanced cases to the King Edward Municipal Hospital in Winnipeg. The patients in the sanatorium on Jan. 1, 1913, were 67; the patients admitted during 1913, 232; the patients discharged, 203; remaining, 96; and the total number admitted since sanatorium was established, 686. Of the 203 discharged, 1.5 per cent. were untreated; 8.3 apparently arrested; quiescent, 28.6; improved, 34.5; unimproved, 15.3; died, 11.8. In addition to the usual hygienic-dietetic means of treatment tuberculin was given to more than half the patients discharged, to 12 for less than one month; to 47 for from one to three months; to 68 for more than three months. Of 127 treated with tuberculin, there were 31 incipient, 44 moderately advanced and 52 far-advanced. In 1912 there were 492 deaths from tuberculosis in Manitoba, representing 8.5 per cent. of the total number of deaths, or 103.8 per 100,000 of the population. In Winnipeg during the years 1909 to 1912, the deaths have fallen from 150 to 96.

LONDON LETTER

THE CLINICAL CONGRESS OF THE SURGEONS OF NORTH AMERICA

LONDON, July 29, 1914.

Clinical Work of the Congress

The thousand American surgeons who have congregated here for the fifth clinical congress are unanimous in calling it a success. Though the twelve general hospitals and medical schools and the thirty special hospitals visited are scattered over the wide area of this city every visitor seemed without difficulty to reach his destination and see the work and man in which he was specially interested. At the hospitals lists of the operations were displayed on the doors, and as all the seats had been allotted there was no overcrowding. At first there was a run on the clinics of certain surgeons and the tickets for seats were exhausted in a few minutes; but on the second day the men seemed to seek the particular work in which they were interested rather than particular men, and the seats of no clinic were exhausted for half an hour. This was evidently due to the discovery that the London surgeons maintained a good general level of work and that ability was not in the hands of a few. It was generally agreed that in some respects the technic was not up to the American level. Thus in the theater of one surgeon of world-wide reputation it was observed that he did some work which should have been done by his nurses. However, a considerable improvement in methods was noted, and the tendency for American surgeons coming to Europe to visit German clinics in preference to English was declared to be passing away. Our visitors were full of praise for the ample preparations made at the hospital for their reception. Some idea of the vast amount of material for demonstrations will be gathered from the fact that at one hospital alone no fewer than 170 operations have been arranged.

A clinic which attracted great attention was Mr. Arbuthnot Lane's at Guy's Hospital. Before a crowded audience he removed the colon for intestinal stasis and removed wedges of bone and inserted a plate in a case of malunion of fracture of both bones of the forearm. While operating he kept up a running commentary which often traveled far from the case and was enlivened by witticisms which convulsed the audience. "Nature never does anything right; never give her a chance." "My views on intestinal stasis are so simple that they are not understood." "As long as a disease is medical and remains in the hands of the physician it is never understood; it is only when it comes into the hands of the surgeon that it is understood." The various membranes which are now described in peritoneal cavity and attached to the names of various persons he declared that he had described years ago. The thing to do was not to bother about giving them names but to understand that they were all adaptations due to Nature's attempt to counteract the effects of gravity in the upright posture. Every one of us was the result of adaptation

to our surroundings. Anatomists did not realize this sufficiently and the subject was taught in an absurd fashion. If persons would only study the anatomy of the coal heaver and the shoe-maker they would begin to understand.

Another clinic which attracted great attention was Mr. Berry's at the Royal Free Hospital. Mr. Berry removed an exophthalmic goiter under local anesthesia with novocain. He also removed a parenchymatous goiter. He laid emphasis on the importance of exact hemostasis. Another operation followed with great interest was removal of a large malignant tumor from the pharynx with ligature of the external carotid artery. He operated for cleft palate by median suture with mattress sutures and no lateral incision. Mr. Berry did not like the flap operation and never performed it. He never saw a patient who spoke well some years afterward, although he had for long asked those who did it to show him one.

The Opening Session

Instead of the usual social functions, the evenings are devoted to papers and discussions. After a presidential dinner given by Dr. Franklin Martin, the formal opening of the congress took place at the Hotel Cecil. Sir Rickman J. Godlee, ex-president of the Royal College of Surgeons, in an address of welcome invited the delegates to a reception at the college where there was the most important museum in the world. They would show the delegates some of the treasures which they would select as far as possible to illustrate clinical facts. Dr. J. B. Murphy, president of the congress, said the work to be conducted this week was a colossal undertaking. Such a task had never before been undertaken by the congress away from home. American surgeons would return with a high impression of London surgery. High as they had esteemed it before, they would esteem it higher still. They would return with an admiration and affection for the profession and people of this great land, and with a feeling that science was a brotherhood that extended round the globe.

GREETING BY AMERICAN AMBASSADOR

The American Ambassador, Mr. Page, extended a warm greeting to the many distinguished citizens of the United States present. He said he need not tell them that they were heartily welcome to London. Their English friends had shown them that. One of the most distinguished teachers of surgery in this country remarked to him that he frequently told his students that no man had a right to consider himself well started in the profession of surgery unless he had been to the United States to see the skill that American surgeons possessed. Now that 1,000 American surgeons found it well worth while to come to England to see how the distinguished surgeons of this kingdom did their work, he could say, "honors easy." He assumed that Englishmen and Americans were anatomically alike, and in the process of time, with a better acquaintance, they would become more and more politically akin. It was a great joy for them to know that at no time in the history of these two great nations was there ever such a cordial and complete understanding of each other as there was at the present time.

DR. RODMAN'S ADDRESS

Dr. W. L. Rodman, President-Elect of the American Medical Association, said that while the congress was not an integral part of the Association, its members were also members of the latter. Hence what concerned them could not fail to receive the sympathetic attention of that great body, the largest medical organization in the world, to whom they all owe their first and best allegiance. Great and varied as have been the activities of the American Medical Association, it had not hitherto specially concerned itself with postgraduate instruction. Its work had been in other spheres, and who would say it had not been well performed? That splendid organization through its various standing committees or councils had accomplished a mighty work in the decennium. The Council on Medical Education had in that short time done more than had been accomplished in the previous century, so that now American schools were fully abreast of those anywhere. The Council on Health and Public Instruction had carried its beneficent work into every state of the Union, compelling all to recognize that, as the public health was the greatest asset of the people, artificial barriers in the nature of state lines must vanish, and where all of the people were so vitally concerned, federal control was essential. A member of the American Clinical Association had told him that the visits of this body to the various clinics of our own and other countries had so impressed some of the members

that the conception of an American Congress of Surgeons resulted. It was natural and generous that the few who had profited by the clinical work of others should, in turn, wish to see a higher standard of clinical efficiency throughout the country. Hence this congress with its first meeting in Chicago in 1910; in Philadelphia the following year; then in New York; to meet again in Chicago in 1913 with an enrolment of more than 4,000. He traced the development of the American College of Surgeons and said that this body, supplementing the Clinical Congress of Surgeons and the American Medical Association, would fill an honorable rôle in the standardization of surgery throughout the world.

Injuries to the Knee in Sports

In the division of general surgery, Mr. Robert Jones of Liverpool read a paper on "The Internal Derangements of the Knee" with special reference to the derangement of the cartilage to which football players and cricketers are liable. He had chosen this subject because little had been written about it in America. It was a surprise to him, because their games, like our own, were rough and we in England knew to our cost that American youths were skilled and strenuous. He was credibly informed that the anatomy of the knee joints of American youths differed but little from our own, and he was forced to conclude either that their cartilages were more securely placed than ours or, which was most unlikely, that the condition was not so generally recognized as it should be. By far the most common derangement of the knee was injury to the internal semilunar cartilage. In nearly all cases the cartilage was displaced inward, and on those rare occasions in which a protrusion had been felt from the outside it was due to hemorrhage following a tear, localized bruising of tissue, or buckling of cartilage, accompanied by effusion, which gave rise to an irregular outline of the articular margin. The most constant symptom of a displaced or fractured semilunar was a sudden inability to extend the knee. The most frequent cause of the displacement or fracture was strain thrown on the internal lateral ligament while the knee was flexed and the tibia rotated outward. The force necessary to cause the derangement in a first injury was usually severe, and the pain acute. The injury might often be encountered on the football field. All movements of the cartilage must be prevented until union of the torn structures was complete, and no lateral strain must be allowed until the lateral ligament, so often injured, had had time to effect a recovery. The injured joint should be treated by complete rest in full extension for four or five weeks. Instead of this, the patient was usually allowed to get up and walk in a week or a fortnight. This was a grave mistake. He refused to operate in any case immediately after the first displacement, as so large a proportion of these patients recovered under appropriate treatment; nor did he encourage operation in cases in which the recurrent trouble was painless and was never followed by effusion in the joint. But he strongly advocated operation when the recurrence was sometimes followed by acute symptoms, and he encouraged it in all recurrent cases in which a strenuous athletic life was a means of livelihood or a physical necessity. Operation was a positive necessity in the case of men who worked among moving machinery, or stood in positions where a yielding knee might mean disaster.

Laryngofissure

In the division of surgical specialties, E. Schmiegelow of Copenhagen, Denmark, read a paper on the "Results of Operations (Laryngofissure) for Cancer of the Larynx." He showed the excellent results which could be obtained in cases in which cancer attacks the vocal cords. He warmly recommended the operation of splitting the larynx, commonly called laryngofissure. This operation was founded in England through the efforts of the late Sir Henry Butlin and Sir Felix Semon, to both of whom Schmiegelow paid a warm tribute. His results showed a lasting cure of more cases than can be proved with cancer in any other part of the body.

Sir St. Clair Thomson gave statistics by which it appeared that he had not lost a case from this operation, and that some patients were alive and well ten years afterward. He pointed out that Schmiegelow was able to record more cases than any other surgeon had ever done in any city of the British Empire. It looked as if British inventions had to go abroad and be born again before they were accepted in the land of their birth. The public did not seem to realize the importance of hoarseness or the profession to know what excellent results could be secured by laryngofissure. He made an

appeal for an expert examination of the vocal cords in any case of hoarseness which did not clear up within three weeks. His own statistics showed 20 per cent. of lasting cures for intrinsic cancer of the larynx. Many of these cases were shown in King's College Hospital.

(To be continued)

PARIS LETTER

PARIS, July 24, 1914.

Personal

Dr. Couvelaire, agrégé, has been appointed professor of clinical obstetrics at the Faculté de médecine de Paris, vice Dr. Pinard, retired.

The Académie des sciences has just awarded a prize of 3,000 francs (\$600) to Dr. H. Vincent, professor at the Ecole d'application de médecine et de pharmacie militaires de Val-de-Grâce, for his work on the typhoid bacillus and typhoid fever. The La Caze prize (10,000 francs, \$2,000) was awarded to Dr. Gley, professor at the Collège de France, for his works on physiology.

At its session on July 21, the Académie de médecine elected Dr. Mairét national associate. Dr. Mairét is professor of the clinic of mental and nervous diseases at the Faculté de médecine de Montpellier, and has been national correspondent in the section of pathologic medicine since 1894.

Lectures on Eugenics

I have already spoken of the formation of the Société française d'eugénique, which publishes a special magazine (THE JOURNAL, Jan. 18, 1913, p. 221). This society will organize, at the beginning of the school year, a series of lecture courses in eugenics at the Ecole des hautes études sociales. M. Edmond Perier, director of the Muséum d'histoire naturelle, will show the relations which exist between eugenics and biology; Dr. Apert, physician at the Andral hospital, will discuss the questions of heredity related to those of eugenics; Dr. Papillault, professor of sociology at the Ecole d'anthropologie, will show how, thanks to eugenics, a well-defined selection may be made; Dr. Pinard, former professor of clinical obstetrics at the Faculté de médecine de Paris, will study eugenics and child-culture; Dr. Weiss, professor at the Faculté de médecine de Paris, will discuss eugenics in its relation to physical culture; Dr. Schreiber, head of the clinic affiliated with the Faculté de médecine de Paris, will show how one may, how one ought to understand eugenics from the point of view of marriage; Dr. Roussy, director of scientific research at the Ecole des hautes études, will study eugenics and the perfecting of the human race.

The Publication of Case Histories, and Professional Secrecy

The conference of lawyers of the Paris supreme court recently discussed the question as to whether or not the physician who publishes observations made at a hospital in a scientific magazine without having asked permission of the patient has violated the obligation of professional secrecy. The conference decided in the negative.

The Esperantist Congress and Physicians

The tenth international congress of Esperanto will be held at Paris, August 2-10, 1914. On this occasion the Association médicale espérantiste universelle, which counts among its honorary members Professors Bouchard, Richet, Gariel and Broca, will send numerous delegates from different nations to Paris. The meetings will be held in one of the amphitheatres of the Faculté de médecine. Technical questions of professional interest will be publicly discussed in Esperanto.

Death of Paul Reclus

Dr. Paul Reclus, professor of clinical surgery at the Faculté de médecine de Paris, whose death was noted in this department last week, was 67 years old, was a member of the Académie de médecine, and last year a commander of the Legion of Honor.

Paul Reclus produced considerable scientific work. He wrote a manual of external pathology in collaboration with Kirmisson, Bouilly and Peyrot, a treatise on surgery in collaboration with S. Duplay, a treatise on surgical therapeutics in collaboration with Emil Forgue and a book on medico-chirurgical practice—all classics to-day. The name of Reclus is associated with local anesthesia by cocaine and novocain and more recently with that of the disinfection of wounds by tincture of iodine and with the conception of cystic disease of

the nipple. He was a prudent and conscientious surgeon and a remarkable teacher.

Election of Dr. Magnan to the Vice-Presidency of the Academy of Medicine

On July 28, the Académie de médecine elected Dr. Valentin Magnan vice-president (who will automatically become president in 1915) in place of the late Dr. Duguet. Dr. Magnan is physician at the Asile Sainte-Anne, president of the Société médico-psychologique and author of a thesis on the relation between general paralysis and insanity which was crowned by the Académie de médecine in 1867.

The Congress for the Advancement of Science

Circumstances have made the Congress for the Advancement of Science held this year at Havre, a Franco-English scientific affair. A large number of members of the British association accepted the invitation of the French association. At the opening session an interesting address was delivered by Sir William Ramsay, president of the delegation from the British association. One of the bonds which unite England and France, he said, was science: "The immortal name of your Pasteur is associated with that of our Lister. I do not exaggerate when I say that to these two men the world owes a debt greater than that to any others. They have saved millions from death. They have saved more lives than the most bloody wars have destroyed."

EMIGRATION AND HYGIENE

In the section of hygiene, Dr. Clerc, maritime sanitary physician, read an interesting paper on emigration. He suggested that an international conference be held to fix uniform conditions for emigration and to secure the return to the country of their origin of all emigrants not allowed to enter the country to which they went. This resolution was unanimously adopted.

Serious Poisoning by Boric Acid Dressing

While wet boric acid solution dressings are harmless, this is not true of dry dressings of powdered or crystallized boric acid. On July 22, Dr. Savariaud reported to the Académie de médecine, a case of a child of 8, deeply burned in the abdominal wall and thighs, whose wounds were powdered with boric acid. The same evening signs of serious intoxication (headache, vomiting, pulse 120, etc.) manifested themselves. The next day after another dressing with boric acid, the symptoms of poisoning were accentuated and diarrhea, prostration and hypothermia appeared. For some days the child's life was in danger; it would certainly have been lost if the boric acid dressings had not been entirely discontinued.

During thirty years, Savariaud has found record of nine deaths from boric acid poisoning.

Offensive Familiarity Toward Hospital Patients

Complaints have been addressed by patients to M. Mesureur, director of the general administration of the Assistance Publique that the employees of the hospitals and the medical students *tutoied* the patients. [The *tutoiement* is the use of the singular (tu, toi) in place of the plural pronoun of the second person (vous). It is used to express familiarity, somewhat as we would use the Christian name, that is, to intimate and inferiors.] M. Mesureur has ordered directors of hospitals to put an end to such misplaced and humiliating familiarities, especially because hospital patients are temporarily in a position where they are unable to protest.

BERLIN LETTER

BERLIN, July 25, 1914.

Personal

Our well-known professor of anatomy, W. Waldeyer, celebrated the fiftieth anniversary of his doctorate July 20.

Dr. Abel, a member of the Prussian medical state department, has received a call to succeed Professor Gärtner at the Hygienic Institute at Jena. Abel was formerly privat-docent of bacteriology in Greifswald.

Professor Albrecht of Berlin has been called to the ear clinic at Tübingen as successor of Wagenhäuser.

The Frankfurt University

The plans have been made to have the new university of Frankfurt-on-the-Main opened October 18 in the presence of the Kaiser. The announcement of lectures just published shows that almost all of the teaching places (Dozentenstellen) are already filled. Only one regular professor is assigned

for each department. In the majority of cases, the medical men already at work at Frankfurt in the municipal and other hospitals have been appointed as professors, such as Schwenkenbecher for internal medicine, Rehn for surgery, Walthard for gynecology, Herxheimer for dermatology, Edinger for neurology, Ehrlich for experimental therapy, etc. To date only the chair for legal medicine has not been filled.

Specialist and General Practitioner

The Mecklenburg Physicians' Association (Aerzte-Vereins-Bund) at its last session adopted the provision in its medical code of ethics that the simultaneous designation physician and specialist physician is not allowable. A similar provision exists in the codes of other medical associations.

Conviction of Dr. Billfinger

The president of the Association of Antivaccinationists of Germany, Sanitary Councilor Billfinger, was sentenced by the Medical Court of Honor for the kingdom of Saxony to a fine of \$250 (1,000 marks) and deprivation of the active and passive franchise in the medical chamber (*Aerztekammer*) for three years because he accepted the position of medical director of the drugless therapy institute—*Naturheilstalt*—of the notorious quack, Bilz, in spite of the fact that he must have known that absolutely intolerable conditions prevailed there in the treatment and care of the patients. As I informed you some time ago, the Bilz Sanatorium was closed by the police on account of these conditions, which were combined with moral danger to the patients.

Prize Offered by the Prussian Academy of Sciences

A prize of \$1,250 is offered for the best study of "Experience as a Factor in Perception." The exact subject is stated as follows: "The share of experience in observations of the human senses is to be systematically investigated and presented. It is not necessary to collect all the individual facts in physiologic and psychologic literature, but the various forms of sense perception are to be defined as carefully as possible according to the manner and limit of their activity, and the common factors and conformity to law in the various fields of the senses are to be set forth. Exact repetition of the observations which are utilized is essential. Extensive independent experimental investigations of decided value are desired." The prize amounts to \$1,250 (5,000 marks). The competing articles may be in German, Latin, French, English or Italian. They must reach the bureau of the academy in the usual form, before Dec. 31, 1916.

International Public Health Work in Jerusalem

More than a year ago, under German initiative, an international health office was established in Jerusalem under the direction of Mühlens, the scientific assistant in the Hamburg Institute for Marine and Tropical Diseases. According to a recently published article of Nocht, director of the Institute for Marine and Tropical Diseases, the support of the institute at Jerusalem at present is shared in common by the German Committee for the Campaign against Malaria in Jerusalem; by Nathan Strauss of New York and by the Society of Jewish Physicians and Scientists for Sanitary Interests in Palestine. The German committee supports the general department for combating malaria, and its chairman is at the same time the director of the institute. Nathan Strauss supports the hygienic and bacteriologic department of which the heads are Drs. Brünn and Goldberg. The Society of Jewish Physicians and Scientists has taken over the department for protection against rabies, originated by the German committee, the director of which is Dr. Behan. An accessory department for the prevention of eye diseases (director, Dr. Feigenbaum) has been added.

The most important task of the office is the malaria campaign which must be prosecuted in three directions. It is necessary, first, to eradicate the parasites in man by the thorough treatment of patients and also of the apparently healthy germ-carriers. As a general rule, the children in Jerusalem are infected, as is usual in old malarial foci. The treatment of schoolchildren with quinin, begun by Mühlens with great success, should be thoroughly carried out. The tactful method of Mühlens easily overcame the superstition and fear of the Mohammedans, their wives and children. Only in the beginning did the taking of blood meet any opposition. The success of the antimalaria treatment in the schools was soon apparent. The general attendance at school which was formerly much disturbed by sickness, became much more regular. The children were more active and their

work was better done. The number of new attacks of malaria grew remarkably less. Quinin, generally in a sugar-coated or tasteless preparation, was readily and regularly taken by the children. The success with schoolchildren facilitated the introduction into families and homes. Dr. Brünn secured the same results in the special Jewish quarters.

Even in the dry season, Jerusalem is a city much infested with mosquitoes, especially with anopheles, the malaria carrier. Their destruction is the second task in the campaign against malaria. In Jerusalem mosquitoes, in addition to the dark dwellings of the inhabitants, infest the numerous cisterns which are of large extent, very old, defectively built and easily accessible to the mosquito. Jerusalem is still exclusively supplied with rain-water for drinking purposes. The cisterns are also the breeding-places of the anopheles mosquito, and many swarm with mosquito larvae. If the cisterns were screened against mosquitoes, the mosquito plague, under present conditions, would cease in Jerusalem.

By closing the cisterns to mosquitoes and doing away with the present unhygienic method of drawing water by pails which are let down through larger or smaller openings, generally left uncovered, and by replacing the pails by pumps in well-covered cisterns, it has been possible already to diminish the mosquito plague to a remarkable extent in many parts of Jerusalem.

Here the third form of the malaria campaign must begin by the education of the population, awakening their interest and winning their active cooperation in the removal of nuisances, and by permanent inspection of the cisterns by a health commission (mosquito commission). The authorities of the city have, moreover, made a permanent annual contribution to the work of the health office.

The campaign against tuberculosis has proved to be much more difficult and less promising; it will also require much larger means. Particularly the improvement of the incredibly wretched dwellings of the native population, Jews as well as Mohammedans, will require the efforts of many years and the expenditure of considerable funds. Moreover, carrying out a long period of curative treatment such as is necessary in tuberculosis will be found to be very difficult.

The campaign against other infectious diseases in Jerusalem will depend chiefly on the introduction and progress of a general communal health movement, of which hitherto there have been only very small beginnings. According to the latest newspaper reports, the supply of the city with good spring water by a system of water-pipes has now been undertaken by a French company. The accomplishment of this plan would render the suppression of typhoid, dysentery and other infectious diseases much easier, especially among the poorer population, who depend on the old cisterns often contaminated with water from the streets. It remains to be seen whether the large institutes supported by European funds will give up their beautiful, roomy and entirely unobjectionable cisterns after the establishment of the water system, and especially whether the removal of the anopheles nuisance will be particularly assisted by the introduction of a public water-supply.

Marriages

LOUIS FLOYD MURRAY, M.D., Santa Fe, N. Mex., to Miss Adelaide Dickinson of Washington, D. C., at Albuquerque, N. Mex., July 27.

DONALD LONSON STILWELL, M.D., Detroit, Mich., to Miss Maude Marie Kellerman of Pittsburgh, Pa., June 27.

OSCAR WILLIAM LINDORFF, M.D., to Miss Hedwig Charlotte Wahlburg, at Chikungelang, China, June 29.

ACHILLES EDWARD DAVIS, M.D., to Miss Josephine K. Robinson, both of New York City, July 30.

FRANK HUGHES LALLY, M.D., Varina, Ia., to Miss Mary Catharine Barry of Jackson, Neb., July 15.

WILLIAM EDWIN JOINER, M.D., to Miss Alice Belinda Johnson, both of Seattle, Wash., July 30.

CHARLES ROSS BENNETT, M.D., Graham, Ky., to Miss Anna J. Patton of Hartford, Ky., June 23.

SETH FENELON ARNOLD, M.D., Boston, to Miss Irl Gann of Benton, Ark., at Boston, June 27.

WILLIAM J. BUCK, M.D., to Miss Catherine Mary Hampton, both of Gainesville, Fla., July 8.

Deaths

Philip Matthew Wagner, M.D. Ohio Medical University, Columbus, 1896; a Fellow of the American Medical Association; of Canal Dover, Ohio; president of the Tuscarawas County Hospital; a specialist on diseases of the eye, ear, nose and throat; a member of the board of education for ten years; local surgeon of the Baltimore and Ohio System; once a member of the city council; a member of the Seventy-Sixth General Assembly; while studying in Germany, was taken ill with cholelithiasis in Berlin, and died while undergoing operation for this condition, July 24, aged 46.

Grace Greenwood Prior Yankauer, M.D. Woman's Medical College of the New York Infirmary for Women and Children, New York City, 1898; a Fellow of the American Medical Association; assistant surgeon to Mt. Sinai Hospital, New York City, and a member of the staff of the New York Eye and Ear Infirmary; was instantly killed in an accidental fall from the window of her apartment in New York City, July 28, aged 40.

Frank Ely Osborne, M.D. University of Nebraska, Lincoln and Omaha, 1903; postmaster of McAllen, Tex.; a member of the State Medical Association of Texas; formerly physician to the Nebraska Institution for Feeble-Minded Youth, Beatrice; while attempting to cross the tracks of the St. Louis, Brownsville and Mexico Railroad, near Donna, Texas, in his automobile, July 30, was struck by a train and killed, aged 36.

Adelaide M. Griffin Tucker, M.D. Woman's Medical College of the New York Infirmary for Women and Children, New York City, 1895; member of the staff of the Bradford City Hospital; a member of the Medical Society of the State of Pennsylvania; for several years a specialist in diseases of the eye, ear and throat of Bradford, Pa.; died in the Bradford Hospital, July 24, after a surgical operation, aged 43.

Francis M. Bennett, M.D. New York Homeopathic Medical College, New York City, 1883; for many years a member of the school board of Springfield, Mass.; a member of the American Public Health Association; and a member of the staff of the Wesson Memorial and Wesson Maternity Hospitals; died at his home in Springfield, about July 29, aged 57.

Thomas E. Heenan, M.D. University of Pennsylvania, Philadelphia, 1868; for many years in the diplomatic service of the United States; for twenty-three years consul at Odessa, Russia; and later consul at Newchwang, China; Warsaw, Russia, and Fiume, Austria-Hungary; died in the latter city, June 26, from heart disease, aged 62.

George Irvin Barwick, M.D. University of Maryland, Baltimore, 1894; a member of the Medical and Chirurgical Faculty of Maryland; for many years a practitioner of Kennedyville, Md.; but for the last four years a resident of Baltimore; died at his home in that city, July 25, from angina pectoris, aged 45.

Thomas Carman Hodge, M.D. Atlanta College of Physicians and Surgeons, 1908; of Atlanta, Ga.; a member of Southern Medical Association and the Medical Association of Georgia; assistant to the chair of anatomy in his Alma Mater; died in a sanitarium in Atlanta, July 28, aged 29.

Arthur Parker Sargeant, M.D. University of Minnesota, Minneapolis, 1913; of Minneapolis; formerly intern in the Minneapolis City Hospital; while endeavoring to save a woman from drowning in Lake Carlos, near Alexandria, Minn., July 30, was drowned, aged 28.

William Henry Carpenter, M.D. Philadelphia University of Medicine and Surgery, 1869; Dartmouth Medical College, Hanover, N. H., 1876; of Boston; a specialist on diseases of the eye, ear, nose and throat; died at his home in Brookline, Mass., July 23, aged 77.

John Irving Russell, M.D. Willamette University, Salem, Ore., 1909; a Fellow of the American Medical Association and proprietor of the Lakeview, Ore., Sanitarium; died in the Good Samaritan Hospital, Portland, Ore., July 25, from nephritis, aged 28.

Robert P. Page, M.D. University of Pennsylvania, Philadelphia, 1861; a member of the medical society of Virginia; surgeon in the army throughout the Civil War; died at his home in Berryville, Va., July 26, aged 76.

Charles Allen Holbrook, M.D. Bennett Medical College, Chicago, 1878; of Dorchester, Neb.; died in the Nebraska State Hospital, Lincoln, July 14, from senile debility, following a cerebral hemorrhage, aged 73.

Sherman M. Beeman, M.D. Washington University, St. Louis, 1881; for many years a practitioner of Chillicothe, Mo.; died at the home of his son in Denver, Colo., July 27, from senile debility, aged 77.

John Henry Griffith, M.D. Jefferson Medical College, 1870; a Fellow of the American Medical Association; twice mayor of Philipsburg, N. J.; died suddenly at his home in that city, July 28, aged 72.

William T. Benson, M.D. College of Physicians and Surgeons, Kansas City, Kan., 1902; of Kansas City; died at the home of his father in that city, July 29, from appendicitis, aged 34.

James Ball Rogers (license, Louisiana) for many years a practitioner of Allen Parish, La.; died at his home near Kinder, La., July 16, from disease of the heart and kidneys, aged 76.

Charles E. Booth, M.D. Rush Medical College, 1872; for twenty-five years a practitioner of Minneapolis; died in the Asbury Hospital in that city, July 25, aged 74.

George W. Williams, M.D. University of Louisville, Ky., 1878; for thirty-one years a practitioner of Pittsburg, Kan.; died at his home in that city, July 29, aged 64.

Charles Thomas Buffum, M.D. College of Physicians and Surgeons in the City of New York, 1877; of New York City; died at Wainscott, L. I., July 29, aged 61.

Lee Osborne Scott, M.D. Rush Medical College, 1905; a member of the Illinois State Medical Society; died at his home in Rockford, Ill., June 26, aged 36.

Herman Berberich, M.D. Jefferson Medical College, 1901; of Philadelphia; died from heart disease while surf-bathing at Wildwood, N. J., July 26, aged 36.

Gustave A. Heidel, M.D. St. Louis College of Physicians and Surgeons, 1897; died at his home in Muscatine, Iowa, July 16, from heart disease, aged 42.

Herbert Forrest Williams, M.D. Hahnemann Medical College, Philadelphia, 1896; died at his home in Philadelphia, July 26, from tuberculosis, aged 42.

Carl G. Lindeblad, M.D. Rush Medical College, 1908; formerly of La Grange, Ill.; died in his apartments in Albuquerque, N. Mex., July 30, aged 33.

James Turner Persons, M.D. University of Alabama, Mobile, 1890; died at his home in Bayou Labatre, Ala., about July 18, from heart disease.

Hilary F. Oliver, M.D. University of Pennsylvania, Philadelphia, 1858; of Birmingham, Ala.; died in Woodlawn, Ala., May 18, aged 76.

Sanford B. McClure, M.D. Cincinnati College of Medicine and Surgery, 1874; died at his home in Allegany, N. Y., June 30, aged 79.

Albert Roberts Pyne, M.D. University of Toronto, 1887; died at his home in Toronto, July 6, from cerebral hemorrhage, aged 65.

Ezra John Guyott, M.D. Hahnemann Medical College, Chicago, 1882; died at his home in Utica, N. Y., June 22, aged 60.

Almas P. Bogue, M.D. Georgetown University, Washington, D. C., 1872; died at his home in Washington, May 10, aged 66.

Alger William Rice, M.D. New York University, New York City, 1880; died at his home in Marion, Mass., May 12, aged 59.

James Raizon, M.D. Rush Medical College, 1891; died at his home in Trinidad, Colo., July 15, from heart disease, aged 59.

Christopher Johnston, M.D. University of Maryland, Baltimore, 1880; died at his home in Baltimore, June 26, aged 58.

Alfred Royce Brundage, M.D. Albany (N. Y.) Medical College, 1890; died at his home in Chicago, July 20, aged 54.

John L. Van Alstyne, M.D. Albany (N. Y.) Medical College, 1862; died at his home in Binghamton, N. Y., May 18.

Joseph William Russell, M.D. Jefferson Medical College, 1907; died at his home in Cleveland, Ohio, July 15, aged 30.

William Watson McCulloh, M.D. University of Pennsylvania, 1898; died at his home in Baltimore, July 19.

John Joseph Mitchell, M.D. Harvard Medical School, 1902; died recently at his home in Charlestown, Boston.

Joseph Remi Tanguay, M.D. Detroit Medical College, 1871; died at his home in Detroit, July 20, aged 69.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

PODOLAX

"Podophyllin With the Gripe Taken Out" Proved a Phenolphthalein Nostrum

L. E. Warren, Ph.C., B.S.

CHICAGO

"PoDoLax" is being extensively advertised as a laxative by the E. E. Sutherland Medicine Co. of Paducah, Ky. The claim is made that:

"PoDoLax is not an accidental discovery nor an Indian Remedy."

It is claimed that on the other hand:

"It is the result of hard study by the brightest minds in the medical profession. The pleasant taste is the effect of the work of a first-class chemist, so combining the drugs of the prescription as to eliminate the objectionable taste and at the same time retain their strength."

The name "PoDoLax" is apparently intended to suggest that podophyllin is the chief constituent of the remedy, and this implication is quite unmistakably conveyed in the following expression found in one of the advertisements for the preparation:

"PODOLAX

Podophyllin with the Gripe taken out."

Also in a circular devoted to the exploitation of PoDoLax and other nostrums the following statements are found:

"Now a new name is before the world, which is made up from the words 'Podophyllin' and 'Laxative.'"

"'PoDoLax' is the word.

"'PoDo' from Podophyllin—

"'Lax' from Laxative or gentle rather than purgative.

"PoDoLax is Podophyllin with the gripe taken out. The only objection ever made to Podophyllin was the griping, and that is entirely overcome in PoDoLax.

"PoDoLax is humanity's oldest and best proven remedy, made pleasant.

"Mandrake is the Biblical term and is first mentioned in Genesis also in the songs of Solomon.

"Some of the doctors . . . still give Podophyllin because ever since the days of Jacob, Mandrake, as it was called in the Bible, has been the best of all to start the Bile.

"A harmless, never-failing, natural remedy, as pleasant to take as maple syrup. . . ."

Aside from these statements and the declaration on the label that PoDoLax contains 6 per cent. of alcohol, no information concerning the composition of the preparation is given. Since from its physical appearance it seemed improbable that the preparation could contain much resin of podophyllin it appeared worth while to examine a specimen of PoDoLax with the view of determining its laxative constituents.

The product is sold in 5-ounce panel containers which retail at fifty cents. The preparation examined was a dark brown, syrupy liquid having an aromatic, sweet taste and an odor like a mixture of anise, saffrafras and wintergreen. It contained a considerable quantity of finely divided crystalline material in suspension. Some of this was separated by filtration, washed with water and identified as phenolphthalein by the usual tests. Another laxative substance was also present, which appeared to be an extract of senna. Large quantities of sugar (sucrose) were present. Small quantities each of alcohol, ammonium compounds, oil of wintergreen and possibly other volatile oils were also found. A determination of alcohol gave 4.47 per cent. by volume. The residue on drying amounted to about 71.5 gm. per hundred c.c. Podophyllin was absent or not present in more than traces. Phenolphthalein was determined and about 1.6 gm. per hundred c.c. found. This is equivalent to about 1.8 grain in each directed dose of PoDoLax. Whether or not other laxatives are present in small quantities matters

little since phenolphthalein and senna are the essential medicinal ingredients, of which the former probably predominates. From the results of the examination it appears that PoDoLax is an aromatized syrup containing phenolphthalein in suspension and fortified by the addition of an extract of senna. Phenolphthalein is a synthetic compound made from coal-tar. Therefore, PoDoLax cannot be a "natural remedy" and to advertise such a preparation as

"Podophyllin with the gripe taken out"

is to offer it under claims that are misleading, false and fraudulent. That the manufacturer knows this is perfectly evident from the fact that these lying claims do not occur on the label of the trade package or in the circulars which accompany it—where they would come within the purview of the law—but are found in advertisements and in circulars which reach the consumer in other ways. Since the Biblical mandrake, *Mandragora autumnalis*,¹ has no botanical or therapeutic relation to the American mandrake, *Podophyllum peltatum*, the attempt to give Biblical sanction to the exploitation of PoDoLax by connecting it with the mandrake of the Bible is to be expected from the usual ignorance, stupidity and dishonesty of the "patent medicine" exploiter.

To sum up:

1. PoDoLax is sold under the claim that it contains podophyllin, whereas it contains none, or at least not more than traces. Its chief medicinal ingredient is phenolphthalein.

2. The false claims concerning the composition of PoDoLax do not occur on the labels of the trade package or in the circulars which go with it, but are made in other ways. This shows the exploiter to be aware of the fraud and deceit practiced in making and selling the nostrum.

Correspondence

"Abuse of Normal Salt Solution"

To the Editor:—In THE JOURNAL, July 25, 1914, p. 307, appeared an article on the "Abuse of Normal Salt Solution" which prompts me to make a few remarks on scientific fairness.

This article, like not a few others of recent years, is apparently an effort to discredit the work of Prof. M. H. Fischer, and incidentally to introduce a subject that has nothing to do with the title, namely, the use of glucose solutions as substitutes for normal saline. This article is, in one particular respect, quite unlike most of the others of similar trend; that is to say it makes use of hearsay evidence, faulty case reports, and undigested references to the literature.

I shall make no attempt to discuss all the references cited by the author. Many of them deserve citation in connection with edema and nephritis, but also many of them do not. One of the most noteworthy instances is the paper of Newburgh (*Boston Med. and Surg. Jour.*, 1913, clxix, 40). Newburgh's work was a perfectly satisfactory bit of observation which almost, if not completely, supported Fischer's contentions, though Newburgh did not interpret it that way, owing perhaps to his (at that time) ignorance of the physiochemical action of salts on colloids. Otherwise he would have known that to discontinue digitalis and magnesium sulphate and place his patients on alkaline sodium chlorid solution would not tend to improve their condition.

The really laughable citations are two—one from Bain (*Brit. Med. Jour.*, Oct. 5, 1912) and one from Stevenson

(same journal, Dec. 28, 1912, p. 1749). Bain's case was one of a child who was edematous. Bain was told that the child may have eaten salt. The physician ordered that the child should have no salt with its food and that all salt should be placed beyond its reach. He prescribed a *simple mixture* of magnesia and compound tincture of cardamom, and castor oil at bedtime. Four days later the edema had disappeared. Stevenson's patient was a young married woman who suffered from general edema "for which no cause could be found except the excessive use of salt." Stevenson was told that the whole family [of the patient] was very much addicted to salt eating. He ordered the salt discontinued and the edema disappeared. In the same volume of the *British Medical Journal* (p. 1057) is the report of another case which Dr. Litchfield missed. It is by Midelton, who says that he had a patient with exophthalmic goiter who suffered from excessive edema. He was told that she ate large quantities of salt. This habit he ordered discontinued. After that the edema "lessened greatly." Midelton concludes his report as follows: "Patients who are fond of highly salted food sometimes refuse to give it up. I know of several such who have puffy eyelids and slight edema of the feet, especially at night." And cases such as these are used to help nullify the serious work of scientific men!

The work of Lepine (*Rev. de méd.*, 1911, xxxi, 744) quoted in the article I am discussing is not a report that has any value in this connection, except in a very roundabout way, for Lepine's conclusion is that while the state of chlorid retention has something to do with hysteric cases, yet the pathogenic action of the chlorid retention is complex and certainly indirect.

Blum, also quoted (*Sem méd.*, Sept. 13, 1913; abstr., THE JOURNAL, Oct. 21, 1911, p. 1408), says that many symptoms and disturbances following injections are due to sodium chlorid, and refers to the salt fever of infants. He says it is better to add a little alkali to the salt solutions.

Geyster (*Am. Med.*, 1914, lvii, [N. S. 9]), after urging that normal saline has a wide field of usefulness, says: "It would be strange if a remedy as potent and yet as simple as the normal salt solution should escape indiscriminate and thoughtless use by the inexperienced." He then goes on to tell what he means by that and makes very much the same points in one direction as does Professor Fischer.

Burnett's experiments (*Jour. Biol. Chem.*, 1908, iv, 57) have nothing to do with the case, except to lengthen the bibliography, because he used seawater, and because he used it in enormous doses given in short periods of time. For instance, he gave a 2,200-gm. rabbit 400 c.c. of a one-sixth molecular sea-water in three-fourths of an hour. Beside, he concludes that the magnesium in the sea-water is responsible for the glycosuria which follows its injection.

I shall not continue with these references of Litchfield. I am glad to admit once more that some of the others have a bearing on the problem. But that is not the point. The point is that a large proportion of the references quoted by Litchfield have no bearing on the problem, but have for one or another reason been perversely used, and that is not scientifically fair.

Moreover, when the criticisms of a man's work are cited as references against his work, his responses to criticism surely should be used, as, for instance, Fischer's response to the almost ridiculous papers of Moore (THE JOURNAL, Oct. 19, 1912, p. 1429), and his response to the unsigned attack by a writer in the *Archives of Internal Medicine*.

As for the "Controverted Theory of Nephritis" (THE JOURNAL, June 20, 1914, p. 1971), the title of that editorial was stupid, since the article it quoted had to do with the method of production of the albumin in the urine, that is, with a symptom and not with the basic condition.

Professor Fischer's book did not "calmly disregard all of the work just mentioned," but considered it in the light of his experimental work, discarded most of it so far as applications were concerned, and then proceeded to show to the holders of the older theories that when their patients were about to die from lack of salt and alkali, he could save them

1. *Mandragora autumnalis* is a poisonous, alkaloid-bearing member of the nightshade family (Solanaceae) and is a close relative of belladonna. It was prized by the ancients in the belief that it would cure barrenness, but has never been employed as a cathartic. *Podophyllum peltatum* is a native of America, belongs to the barberry family (Berberidaceae) and contains no alkaloids. Although its cathartic properties have been known by the American Indians from prehistoric times the plant was not described by botanists until 1731 (Catesby: *Natural History of Carolina, Florida and the Bahama Islands*, 1731, i, 24). Consequently it could not have been known to the writers of the Bible.

by using a newer method. In other words, his theory *works* in properly selected cases. And all he has done has been to pass the so-called authorities, when he found that what they said was not true.

Professor Fischer, and all really scientific research workers, will welcome criticism if it be fair. He was the first to suggest that not all that he believed might be true (*THE JOURNAL*, Sept. 5, 1908, p. 830). But he should not be burdened by the prejudice which accompanies and follows authority.

The burden of proof is on those of the opposition, and it will take much time and experimentation to successfully balance the work that has been done while they were talking. Many of them will have to learn the new language, which is slowly but surely replacing the antique dialects of medicine, before they can hope to even understand what is being talked about.

In conclusion, it is pleasant to add that Professor Fischer was one of the workers who have been instrumental in showing why glucose is valuable and on what its action in certain types of acidosis depends (*Science*, 1913, xxxviii, 486). It is to be hoped that no one will discontinue its use on this account. PAUL G. WOOLLEY, M.D., Cincinnati.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

SEALING OF MUSEUM JARS—PREVENTION OF MOLDS IN KAISERLING SOLUTION

To the Editor:—1. Please give me a satisfactory formula for sealing museum jars.

2. Also, some manner, or change in method, which will guard against the growth of molds in Kaiserling solution.

HERBERT V. L. SAPPER, Norman, Okla.

ANSWER.—1. It is the opinion of several authorities, to whom this question has been referred, that those jars with metallic lid clamps and jars having ground stoppers are adequate for the purpose. Sealing is unnecessary as it often becomes essential to change the fluid on the specimens, a difficult process when the jars are sealed. In some places the use of museum jars, except in cases of very large specimens, has been abandoned. Reference may be made to an improved method of mounting specimens on watch glasses (Day, L. E.: Improved Method of Mounting Museum Specimens, *American Veterinary Review*, October, 1913, p. 66).

2. It has been found that the addition of a few crystals of thymol to the Kaiserling solution, at the time of making, is a good preventive against the growth of molds. About 1 gm. of thymol to a gallon of fluid is sufficient. Another precautionary measure is boiling of the solution just previous to its use.

ROSS JONES AND NOGUCHI BUTYRIC ACID TESTS

To the Editor:—1. Are the Ross Jones test and the Noguchi butyric acid test reliable in determining the diagnosis of syphilis?

2. How do these tests compare with the Wassermann test?

F. S. WHITE, M.D., San Antonio, Tex.

ANSWER.—1. The Ross Jones test and the Noguchi butyric acid test are not specific tests for syphilis, but indicate simply an increase in the amount of protein in the cerebrospinal fluid.

2. These tests, when positive, are not of as great significance as the Wassermann test, that is, they do not certainly indicate syphilis.

The Summer Question.—Summer brings baby problems. Babies live in a different world than adults and sudden changes in food, excessive heat and other shocks to their vibrating vitality may easily swing the pendulum to the danger side. A baby is a living "factory" of possibilities and we should see that it is a business necessity to keep his "works" at the utmost efficiency.—*Bull. Chicago School Sanit. Instr.*

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALBERTA: Edmonton, September 15. Registrar, Dr. Cecil E. Race, University of Alberta, Edmonton.

IOWA: Des Moines, September 10-12. Sec., Dr. Guilford H. Sumner, Capitol Bldg., Des Moines.

NEW YORK: September 22-25. Chief of Examination Division, Mr. Harlan H. Horner, Department of Education, Albany.

Arkansas Homeopathic May Report

Dr. Scott C. Runnels, secretary of the Homeopathic State Medical Board of Arkansas, reports the oral, practical and written examination held at Little Rock, May 27-29, 1914. The number of subjects examined in was 12; total number of questions asked 120; percentage required to pass was 75. The total number of candidates examined was 8, all of whom passed. Two candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Kansas City Hahnemann Medical College (1912)	80,	(1914)	77, 82.2, 83.1, 85.4, 87.5, 91.7, 95.4.

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Georgetown University School of Medicine.....	(1891)	New York
Cleveland Homeopathic Medical College.....	(1904)	Ohio

The following questions were asked:

ANATOMY

1. Define anatomy. 2. How many bones in the upper extremities? Name them. 3. Name the branches given off the arch of the aorta. Where is the innominate artery and what are its divisions? Name the branches of the external carotid. 4. Name the divisions of the digestive tract, and describe the duodenum. 5. Where is Scarpa's triangle? Give its boundaries and name the important structures contained therein. 6. Give the origin and insertion of five muscles. 7. Name the cranial nerves and give their distribution. 8. Give the blood-supply of five organs of the body. 9. Locate and describe a femoral hernia and give its coverings, beginning at the surface. 10. Give the fetal circulation.

PHYSIOLOGY

1. Give the composition, reaction and uses of blood. 2. Name the secretions of the alimentary canal, their reaction and functions. 3. What is the physiologic function of the liver? 4. Describe urea, its occurrences, variations in the quantity excreted and recognition in the voided urine. 5. What is the function of the first cranial nerve?

CHEMISTRY

1. Give the chemical name and formula of (a) common table-salt, (b) marble, (c) plaster of Paris, (d) borax, (e) blue vitriol, (f) soot, (g) vinegar, (h) verdigris, (i) tartar emetic, (j) sugar of lead. 2. Define (a) base, (b) acid, (c) salt; give examples. 3. Name ten elements used in their pure state in medicine. 4. Write the equation of the reaction when pure wood alcohol is burned; (b) when corrosive sublimate and potassium iodid meet in solution. 5. What is meant by (a) hard water, (b) soft water? (c) how may hard water be made soft? (d) What does the presence of an abnormal amount of chlorine in water indicate? (e) How would you determine its presence? 6. Name five substances used as antiseptics or disinfectants and give their chemical formula. 7. What is grain alcohol? Give formula. Name some substances from which it is derived; describe the process of preparation; name some contaminations and give mode of determination. 8. Give three tests for sugar in urine. 9. Give five tests for albumin in urine. 10. Give composition of human milk.

PATHOLOGY

1. What diseases of the mother may be transmitted to the fetus? 2. Define anemia, hyperemia and leukemia and give examples of the cause of each. 3. Difference between congestion and inflammation. 4. How does sarcoma differ from carcinoma? 5. What determines the benign or malignant character of a new growth? 6. Describe the etiology of malaria. 7. Give pathology of different forms of pleurisy. 8. What diseases are attended with ulceration of the intestines? 9. Describe changes in cirrhosis of the liver. 10. Distinguish between hematuria and hemoglobinuria; causes of each.

BACTERIOLOGY

1. Define following terms: coccus, bacillus, spirillum, obligate anaerobe, facultative anaerobe and give examples of each. 2. Name the organisms commonly found in (a) furunculosis, (b) tonsillitis. 3. Define germicide, antiseptic, asepsis, sterile and disinfectant. 4. Define parasite, saprophyte, spore, flagellum, mycelium. 5. Name five culture-media. 6. Name pathogenic organisms having exogenous toxins. 7. Give dif-

ferential characteristics of organism causing (a) diphtheria; (b) tuberculosis. 8. Name ten diseases caused by specific organisms. 9. Name ten diseases caused by organisms but not specific. 10. Give brief outline of (a) Widal test; (b) Wassermann.

HYGIENE

1. Mention five preventable diseases. 2. (a) Mention five satisfactory disinfectants and give indications for their uses. (b) What gases are most efficient as disinfectants? 3. (a) How can malarial districts be made healthy? (b) How can *Anchylostoma duodenale* districts be made healthy? 4. Describe in detail the sanitary precautions necessary in typhoid fever. 5. Describe the agency of the ptomaines in inducing disease, and the disorders produced by them.

DIAGNOSIS AND PRACTICE

1. Give differential diagnosis of pneumonia, bronchitis, pleuritis. 2. Give treatment of pneumonia, including indications for three remedies. 3. Give etiology, symptoms and treatment of pericarditis. 4. Define gastritis. Give diagnostic indications. Outline treatment. 5. Describe typical typhoid fever to a fatal termination. 6. What is cerebral anemia? What is cerebral hyperemia? Differentiate. 7. Give cause, symptoms and terminations of poliomyelitis anterior. 8. Measles: Describe a case and give differential diagnosis from scarlatina. 9. Give differential diagnosis of variola and varicella. 10. What is malaria? Describe, briefly, different types of malaria, and give clinical diagnosis between continuous type and typhoid fever.

MATERIA MEDICA

1. *Apis mellifica*: Give method of preparation of this remedy, and give two characteristic symptoms. 2. *Belladonna*: Give the common name of this drug. Give the brain symptoms indicating its administration. Name the alkaloids of belladonna. 3. *Conium maculatum*: Give characteristic symptoms calling for its use in disease of the urinary organs. 4. *Ipecacuanha*: Give symptoms calling for this remedy in disease of the digestive tract. 5. Give characteristic symptoms of lachesis. 6. *Opium*: Name two alkaloids and give their physiologic action. 7. *Podophyllum peltatum*: Give the aggravations and ameliorations indicating administration of this remedy. 8. *Rhus toxicodendron*: Give the characteristic symptoms of this drug. 9. *Sulphur*: What are the general indications for this remedy? 10. *Veratrum viride*: Give the abdominal symptoms calling for the administration of this remedy.

THERAPEUTICS

1. Give indications for chamomilla, mercurius vivus and arum triph. in stomatitis. 2. Differentiate acute catarrhal laryngitis, croupus laryngitis and diphtheria, and outline treatment for diphtheria. 3. Differentiate indications for aconite, hyoscyamine and kali carb. in pericarditis. 4. Give etiology and symptoms of chronic nephritis; mention three leading remedies and give definite indications for each. 5. Differentiate enterocolitis and dysentery. Briefly outline general treatment and name at least two remedies in each case. Give distinct indications. 6. Outline general management of a case of pneumonia, in an adult. Name several remedies, giving indications briefly. 7. Give indications for *Aethusa cynapium*, bismuth and ipecac in vomiting. 8. In treatment of la grippe give indications for *Rhus tox.*, *Eupatorium perf.* and pyrogen. 9. Differentiate indications for *Kali bich.*, *Nux muscata* and *pulsatilla* in stomach disorder. 10. What is erysipelas? Outline treatment.

SURGERY

1. Patient in state of coma, what might it be? Give differential diagnosis. 2. Give ten methods of controlling hemorrhage. 3. Give five methods of anesthesia and their contra-indications. 4. Reset a dislocated inferior maxilla. 5. Name the dislocations of the shoulder-joint. 6. Mention ten varieties of fracture of a long bone. 7. State most common seat of fractures of the clavicle; give treatment. 8. Differential diagnosis of appendicitis and renal colic. 9. Describe four varieties of club-foot. 10. What is Colles' fracture; Pott's fracture?

OBSTETRICS

1. Give brief description of female pelvic anatomy. Name diameters. 2. Give diagnostic points and methods of determining early pregnancy. 3. Give general outline of attention necessary during the puerperal period. 4. Name several of the disorders incident to the period of pregnancy. Give treatment indicated. 5. Give varieties of placenta praevia and treatment. 6. Give etiology of antepartum hemorrhage and treatment. 7. What is third stage of labor? Give management. 8. Give management of breech presentation. 9. Name several complications incident before labor. 10. From beginning of labor until flow of milk is established, what conditions might be met that would definitely indicate *pulsatilla*, *aconite*, *secale cor.*, *ipecac* and *phytolacca*. Briefly outline indications.

GYNECOLOGY

1. Differentiate simple from gonorrheal vaginitis and give treatment for each. 2. Give causes and treatment of ovaritis, acute and chronic. 3. Define metrorrhagia. (b) Name two of its most common causes prior to the menopause. (c) What would you suspect should it occur subsequent to the same? (d) How would you verify your suspicions? 4. Give symptoms, diagnosis and treatment for chronic endometritis. 5. What are the nervous manifestations of amenorrhea? 6. Give etiology and treatment of salpingitis. 7. Give symptoms and treatment of retroversion of the uterus. 8. Name the uses of the uterine sound. Enumerate contra-indications and dangers attending its use. 9. Give merate contra-indications and treatment of pelvis cellulitis. 10. Describe etiology, symptoms and treatment of pelvis cellulitis. 10. Describe the pathologic effects caused by lacerations of cervix and give all reflex disturbances therefrom.

Book Notices

DIGEST OF COMMENTS ON THE PHARMACOPEIA OF THE UNITED STATES OF AMERICA (EIGHTH DECENNIAL REVISION) AND ON THE NATIONAL FORMULARY (THIRD EDITION) for the Calendar Year Ending Dec. 31, 1912. By Murray Galt Motter and Martin I. Wilbert. Paper. Pp. 495. Hygienic Laboratory Bulletin No. 93. Washington: Government Printing Office, 1914.

The preface announces that this, the eighth bulletin of the present series, rounds out three decades of the systematic compilation of comments and criticisms on the Pharmacopeia of the United States. The original publications were based on the sixth edition of the Pharmacopeia, which was published at the close of the year 1882, and the digests have been continued more or less regularly since that time. The material included in the present bulletin has been arranged with a view of conserving space, and despite the fact that it appears to include more references than any of the former publications, the number of pages has been materially reduced. The bulletin is aptly defined by the compilers as an elaborated index of current literature relating to pharmacopeial articles, and from this point of view should be of value to all physicians who are in any way interested in the progress or development of drug therapy. The number and the nature of the comments on the German Pharmacopeia that are quoted indicate a real live interest on the part of the physicians as well as pharmacists of that country in the composition and possible uses of the Pharmacopeia, and should be an incentive to the professional men in this country to emulate. Among the more interesting compilations found in this volume is a table showing the highest and lowest maximum, single and daily doses of widely used potent drugs and preparations included in the maximum dose tables of the several pharmacopeias. The figures given in this table indicate that even with articles that are more or less uniform, so far as the purity and strength of the preparations are concerned, there is nevertheless a marked variation in the amount of drug that is considered harmful in different countries. Current discussions on international uniformity in the standards, requirements and tests for widely used or potent medicaments and the desirability of restricting the scope of the Pharmacopeia to really useful drugs and preparations reflect rather a live interest in these vitally important features of pharmacopeial development. These discussions also appear to indicate an earnest desire to provide for future medical students a safe and sane foundation of knowledge regarding materia medica subjects. The quotations from published reports of officials entrusted with the enforcement of laws relating to the production and sale of drugs indicate that much of the material that is now being sold as medicine is either directly harmful or absolutely useless and that greater care and activity is needed on the part of all concerned to secure reasonable uniformity and purity in the medicines dispensed to patients.

ORGANIC CHEMISTRY FOR STUDENTS OF MEDICINE. By James Walker, LL.D., F.R.S., Professor of Chemistry, University of Edinburgh. Cloth. Price, 6 shillings. Pp. 328. London: Gurney & Jackson, 1913.

The name of James Walker occupies an enviable position in the realm of physical chemistry. Perhaps no other elementary text-book on this subject has been so well received by teachers as that of Walker's, and this speaks all the more for the author, because all recognize the difficult task of presenting the physical side of chemistry in a suitable manner, and yet in a suitably sized text-book. It was a matter of some surprise to note that Walker has recently written a book covering an entirely different field; in fact, he so restricted the name of his text that probably he could have selected no other subject which so thoroughly excludes physical chemistry. Nevertheless, in view of the ability shown in his previous works an equally good and serviceable book might have been expected, but anticipations have not been realized. The book, as the name suggests, is written primarily for the benefit of the medical student who is taking his first course in organic chemistry; but it cannot be recom-

mended as a text especially adapted for medical students, or any other kind; in fact, it is believed that there are many other organic chemistry texts that more nearly approach the demand of an American school. The subject-matter is presented in a rather uninteresting and monotonous manner, while in a few places the English is such as to be quite confusing. Although the book is recent, it cannot be termed "modern." For example, bivalent carbon, a plausible explanation for the poisonous effects of cyanids and carbon monoxid, is not brought forth; no attempt is made to explain molecular rearrangements, a subject with which every student must later come into contact in physiologic chemistry, and very little insight is given concerning the mechanism of reactions, which rather detracts from the book. References are not given, and in certain instances, names which usually are correlated with certain reactions are omitted. Typographic errors occur in a few places, as the formula for metaphosphoric acid (p. 29) and picric acid (p. 183). A few physical data are incorrect, as in the case of the melting-point of pure formic acid.

A matter of great concern to the American teacher in a medical school is the consideration of proprietary medicines. In this book, the proprietary names of medicines are emphasized instead of the clinical names which reveal their actual constitution, and thus the medical student who uses the book is liable to prescribe names rather than drugs. Urotropin, for instance, is clearly brought forth, while hexamethylen-amin, the official name is relegated to the background.

TEXT-BOOK OF LOCAL ANESTHESIA FOR STUDENTS AND PRACTITIONERS. By Prof. Georg Hirschel, I Assistant in the Surgical Clinic, Heidelberg. With an Introductory Preface by Prof. Dr. Wilms. Translated by Ronald E. S. Krohn, M.D. Cloth. Price, \$2.75 net. Pp. 181, with 103 illustrations. New York: William Wood & Co., 1914.

The practice of local anesthesia which has received such extended application in recent years resolves itself into a knowledge of a few anesthetic substances and a minute and exact knowledge of the distribution of the nerves and the technic by which nerve-trunks can be made accessible. For the obtunding agent Hirschel chooses only novocain combined with an epinephrin preparation. Morphin is recommended as a preliminary injection, occasionally to be accompanied by scopolamin. The discussion of remedies, instruments and injection technic is brief, occupying less than ten pages, while the remainder of the book is taken up with the description of the methods of applying anesthesia to the various regions of the body. The descriptions are elucidated by a number of excellent plates showing anatomic relations. The poorly developed state of local anesthesia of the female genital tract is indicated by the little attention given to this phase of the subject. The work may be characterized as quite conservative, presenting no method that has not been well worked out. The application seems to be made wholly to operative work, for although the use of local anesthesia for the relief of pain in laryngeal tuberculosis and obstinate neuralgia is applied on the same anatomic principles, the important developments receive no notice. As a guide to the practice of local anesthesia previous to operation, the work will easily take first rank. The translation is excellent and the value of the work has been enhanced by the addition of an index.

PRACTICAL THERAPEUTICS. Including Materia Medica and Prescription Writing, with a Description of the Most Important New and Nonofficial Remedies passed on by the Council of Pharmacy and Chemistry of the American Medical Association. By Daniel M. Hoyt, M.D., Assistant Physician to the Philadelphia General Hospital. Second Edition. Cloth. Price, \$5. Pp. 426, with illustrations. St. Louis: C. V. Mosby Company, 1914.

While this is not an exhaustive work on pharmacology, it is constructed on such a practical basis as to give it good reason to claim to be a useful one. It aims to found the indications for drugs on their physiologic action, which is explained clearly and briefly. The classification is made according to the principal purpose for which the drug is employed, and the chief space is given to those agents which are likely to be most used by the physician. This discussion

of medicinal agents, together with a chapter on proprietary medicines and dispensing, constitutes the book proper. This book may perhaps be accorded the honor of being one of the first, if not the first, to deal with the patent medicine evil in a separate chapter as of importance to the physician who is to prescribe drugs. The page given to the subject of dispensing is quite inadequate. A fuller discussion of this subject, which is also of great importance to a large class of physicians, would have been very desirable. The rest of the book consists of an appendix which is nearly as large as the body of the work and may even overshadow it in importance. It contains an authorized reprint of the greater part of New and Nonofficial Remedies for 1913, and a bibliography which is singularly brief and certainly much fuller on some subjects than on others. Thus "Benzol in Leukemia" has twenty references while "Emetin in Amebic Dysentery" has only one. Such a bibliography can be of little value to student or teacher. An index of drugs follows which gives briefly the properties of the official drugs with reference to the page of the book where each is discussed. The book throughout follows the unusual custom of printing both terms of the ingredients of prescriptions with initial capitals; thus, Acid. Boric. Carelessness in the use of Latin endings and in the printing of prescriptions is one of the minor blemishes of the work. Despite these criticisms, we repeat that the author has produced a useful work which ought to have its share in the coming regeneration of therapeutics.

TWELFTH ANNUAL REPORT OF THE BUREAU OF SCIENCE, PHILIPPINE ISLANDS. Paper. 1913.

This handsomely printed report of 130 pages, exclusive of the abundant plates and other illustrations, gives only a brief sketch of the tremendous activities of the bureau and its energetic personnel. It is a splendid record of the practical application of scientific study to the health and material welfare of a tropical country in which the problems and the opportunities are both on a tremendous scale of bigness. It is hardly possible to take the space even to enumerate the varied lines of work in which the bureau has been engaged for the past year, but they range from intensive studies of plague, cholera and dysentery and their bacteriology, description and classification of the flora and fauna of the islands, etc., to the fisheries, the making of cement, lime and sugar, and research work in the discovery of new products useful in science and the arts, etc. The report is accompanied by a booklet, made up largely from the information contained in the report, indicating the possibilities of legitimate industry and commercial exploitation in the islands.

SURGERY: ITS PRINCIPLES AND PRACTICE FOR STUDENTS AND PRACTITIONERS. By Astley Paston Cooper Ashhurst, A.B., M.D., F.A.C.S., Instructor in Surgery in the University of Pennsylvania. Cloth. Price, \$6. Pp. 1141, with 1039 illustrations. Philadelphia: Lea & Febiger, 1914.

The impression gained on a reading of this book is one of conservatism and practicability. Both bespeak the good judgment of the author, which is a comforting quality to the student or practitioner who depends on a text-book in any branch as a guide to study or for reference in his daily work. The principles of surgery are well and clearly laid down, and the diseases, accidents, operations and procedures which come largely within the skill and experience of the practitioner who does surgery are given a gratifying amount of attention, with concise but ample description. The more formidable surgical problems requiring the highest technic and knowledge are not neglected, but more details would perhaps be desired by many before attempting such work. Military surgery, the treatment of accidents and the suture of vessels and nerves are subjects detailed in a most satisfactory manner. In regard to fractures the author displays the conservatism taught by experience, no doubt, and early motion, massage and the open treatment are to be employed only with the greatest caution and in exceptional instances. The section on the arthritides is informing and practical. The special branches, orthopedics, gynecology, genito-urinary

surgery and the eye, ear, nose and throat have been treated only so far as they come within the province of the general surgeon. The illustrations, mostly from photographs, are abundant and appropriate to illustrate the text, and the book mechanically is well made.

THE HYPODERMIC SYRINGE. By George L. Servoss, M.D. Cloth. Price, \$2. Pp. 317. Newark, N. J.: Physicians Drug News Company, 1914.

The author has succeeded in producing a good-sized book on a small but important subject. In the short space of twenty pages, he has treated of the syringe and its uses. In enumerating the remedies employed by this method, the general class of bacterins obtains an entrance and the fable of the camel's nose is repeated. The bacterins drag in the subject of the etiology, pathology and treatment of infectious diseases, which occupy the remaining 300 pages, so that we have not merely a book on hypodermic medication but a compilation on the practice of medicine. A study of the structure of the book reveals some interesting facts. While the book is published by an independent firm, it is quite evident that the influence of a prominent manufacturer of serums and bacterins has determined its contents. The author has quoted freely, but a large part of his quotations are from "Working Bulletins" Nos. 1, 8, etc. There appears to be no editorial summarization of these varying statements, and the date of the material is different for the different preparations; for instance, on antidyenteric serum there is scarcely a reference to anything since 1902, while the section on antimeningitic serum refers to the recent epidemic in Texas in 1912, this bringing the article fairly well up to date. Naturally a book discussing the use of these remedies in the broad field of infectious diseases would require more thorough study than can be afforded by the mere clipping of quotations and statistics from various authorities. Such a book to be valuable must be the work of one fully equipped with theoretic knowledge and practical experience.

DIE NASEN-, RACHEN- UND OHRRERKRANKUNGEN DES KINDES IN DER TÄGLICHEN PRAXIS. Von Professor Dr. F. Göppert, Direktor der Universitäts-Kinderklinik zu Göttingen. Spezieller Teil, Enzyklopaedie der klinischen Medizin. Herausgegeben von L. Langstein, C. von Noorden and others. Paper. Price, 9 marks. Pp. 169, with 21 illustrations. Berlin: Julius Springer, 1914.

This small volume on the diseases of the nose, throat and ear in children is a special part of the "Enzyklopädie der klinischen Medizin." The subject-matter is divided into three parts, the first of which embraces the inflammatory diseases of the nose and nasopharynx, especially in their relation to the general system. The second part considers the independent local diseases of the nose and throat, while the third is devoted to the diseases of the middle ear and their results. It is a valuable contribution, especially in regard to the diagnosis and treatment of these conditions in infants, as too little attention in general is paid to these young patients. Of chief interest is the emphasis laid on the interrelationship of the local conditions with diseases that are constitutional in their nature.

ESSENTIALS IN BACTERIOLOGY. Being a Concise and Systematic Introduction to the Study of Bacteria and Allied Microorganisms. By M. V. Ball, M.D., Assisted by Paul G. Weston, M.D., Pathologist State Hospital for Insane at Warren, Pa. Saunders' Question Compend. Seventh Edition. Cloth. Price, \$1 net. Pp. 321, with 118 illustrations. Philadelphia: W. B. Saunders Company, 1913.

The author and editor of this little book propose an attempt "to reflect as faithfully as possible the present status of bacteriology without overstepping the limits set by the scope of a book intended primarily as an aid to students." The scope of the work and want of space have not permitted the consideration of theories and obsolete methods. Part 1 consists of chapters on general biologic considerations and technic of staining, culture, animal experiments, etc.; Part 2 of chapters on the special bacteriology of non-pathogenic and pathogenic bacteria. The appendix takes up yeasts, oidiums, molds, etc. A table at the end, arranged alphabetically by names of species, gives the chief characteristics of the principal bacteria, pathogenic and non-pathogenic.

Miscellany

Suicides and Newspaper Publicity

The probable influence of newspaper publicity of details regarding the nature and kind of substances used in connection with accidental or intentional poisoning is well shown by a compilation from the reports of the coroner of St. Louis for the years 1910 to 1914, inclusive.

The annual period covered by the latest report, April 1, 1913, to March 31, 1914, includes the time during which much unwarranted and in many respects misleading publicity was given to cases of bichlorid poisoning in the newspapers, and the comparative number of cases of poisoning by this agent in St. Louis is suggestive at least of the results that might have been expected. While in a general way the total number of cases of suicide by poisoning in 1913-1914 is comparable with the number occurring in previous years, there is a very marked increase in the number of cases due to the ingestion of mercuric chlorid.

The evident reduction in the number of cases of accidental poisoning from all causes leads one to suspect that newspaper publicity has had in this respect a beneficial influence in that it probably served to call attention to the desirability of safeguarding poisons in such a way that they could not readily be mistaken for other more or less harmless substances. The total absence from the reports for 1913-1914 of accidental cases of poisoning by mercuric chlorid also serves to discount the recent almost hysterical demand for special legislation to protect innocent persons from this deadly poison.

If any further argument were needed to induce newspapers to heed the frequently made request that they omit all mention of the details by which self-destruction was accomplished, it is shown by the accompanying compilation.

SUICIDE BY POISONING

	1910	1911	1912	1913	1914	Total
Arsenic	1	2	3	3	4	13
Mercuric chlorid	1	1	4	3	12	21
Phenol (carbolic acid) ...	81	85	120	119	85	490
Potassium cyanid	3	5	1	3	7	19
Chloroform	2	..	3	1	2	8
Carbon monoxid	13	22	10	27	23	95
Cocain	1	..	..	..	1	1
Formaldehyd	..	..	1	1	3	5
Hydrocyanic acid	2	2	1	1	..	6
Laudanum	1	..	1	1	4	8
Morphin	2	1	..	1	3	7
Muriatic acid	..	..	2	..	..	2
Opium	..	..	..	1	3	4
Oxalic Acid	1	..	3	..	..	4
Phosphorus	2	1	..	..	..	3
Strychnin	1	1	1	1	2	6
Sulphuric acid	..	..	..	1	..	1
Wood alcohol	1	1	1	1	..	4
	112	121	150	163	146	692

ACCIDENTAL POISONING

	1910	1911	1912	1913	1914	Total
Arsenic	1	..	1	1	1	4
Mercuric chlorid	..	1	..	..	..	1
Bromidia	..	..	2	1	1	4
Phenol	7	5	..	1	..	13
Potassium cyanid	2	1	1	..	3	7
Chloroform	12	10	14	14	1	51
Carbon monoxid	..	..	..	..	1	1
Chloral hydrate	..	..	1	..	2	3
Cocain	..	..	..	1	..	1
Hydrocyanic acid	1	..	1	2	..	4
Laudanum	1	1	1	1	1	5
Morphin	..	..	1	..	..	1
Opium	..	..	..	1	..	1
Oil of Cedar	..	..	..	4	..	4
Potomian	..	..	..	..	1	1
Picrotoxin	..	..	1	1	1	3
Strychnin	1	..	..	1	..	2
Sodium nitrate	..	..	..	..	..	..
	25	18	22	27	12	104

The figures given also suggest the desirability of telling the truth in regard to the action of corrosive poisons and the need for refraining from even an intimation that the use of any one poison or substance may lead to a sure and painless death.

In this connection it has been frequently pointed out that mentally unbalanced persons who in a fit of despondency might inflict on themselves serious damage would be likely

to be restrained by the dread of the unknown agony they may suffer from an attempt to do so, and because of this fact it cannot be too frequently emphasized that there are few modes of suicide more painful than death by means of any one of the many corrosive poisons that have been used in the past.

It might also be stated that only a limited number of the attempts at suicide by means of poisons are actually fatal and that in the majority of cases the ingestion of a poison leads to a painful, long drawn out convalescence and may, as in the case of bichlorid poisoning, involve permanent damage to vital organs, such as the kidneys, and thus materially influence the health and well-being of the individual for years to come.

Making Application of Available Knowledge

In an inaugural lecture on "The Necessity for the Practical Application of Available Knowledge," delivered before the class of the Veterinary Institute of the University of Melbourne in March, Dr. James W. Barrett cites two interesting points to illustrate his thesis. They concern infant mortality and the low standard of health of Australian women. Barrett says it is well ascertained in all countries that when the mean temperature of the air rises to 60 F., artificially-fed babies begin to die and that the death-rate, particularly in the first year, is high because of our failure to apply principles well known in prevention.

That the deaths are preventable in large part he asserts is proved by the experience of New Zealand, where the death-rate among infants in 1912 was about 51 per thousand as compared with 68 in Australia, 232 in Russia, 170 in the German Empire (1909) and 107 in the United Kingdom (1909). For the cities the comparison is still more striking, the rate in 1910 in St. Petersburg and Moscow being 280, Berlin 155 and London 103, while the rate in various Australian cities runs from 81 to 77, reaching the lowest point at Dunedin, New Zealand, where the rate was 38. The reduction in the death-rate in infants in New Zealand has been chiefly in gastro-enteritis, as is shown by the percentages of deaths from this cause, which in 1908 was 23.74, with a rapid reduction to 12.63 in 1912. While part of this reduction may be due to improvement in the milk-supply of New Zealand cities which, however, Barrett says is no better than that of Australian cities, or to the operation of the midwives act and the establishment of maternity homes, he believes it is due chiefly to "special and practical education."

In 1907 the Society for the Health of Women and Children was founded in New Zealand by Dr. Truby King, with the object of caring for the infant before birth and during the period of infancy by practical eugenics; to rear a strong and healthy race by constructive and not by restrictive means, and not to eliminate the unfit, but to prevent their production by aiding in the full development of the healthy. With the encouragement and assistance of Governor and Lady Plunkett, who appealed for assistance to the people, nurses were trained in the best methods of feeding and care of infants and sent throughout New Zealand to educate the women in the principles of child care and especially to urge breast-feeding. There are now twenty-seven of these "Plunkett nurses" and the cost is about \$20,000 a year, more than half of which is met by the government. The result, as Barrett says, has been achieved by applying scientific principles in the home.

On the second point, Barrett calls attention to the fact that while the general death-rate in Victoria (11.52 per thousand) and Queensland (10.65 per thousand) is low, it is notorious that the appearance of the women is not satisfactory. The men appear to enjoy excellent health, but in many instances the women appear anemic, neurasthenic and worn. This is commonly ascribed to the tropical climate, but this does not account for the health enjoyed by the men and the general low death-rate. The explanation Barrett finds in physiologic conditions and the wet-bulb temperature. Haldane has shown that work is rendered

impossible in a wet-bulb temperature of from 90 to 91 F., and that in a wet-bulb temperature over 78 F. a great deal of work could not be done with comfort. This applies whether the wet-bulb temperature is produced by a high dry-bulb and a low percentage of moisture, or by complete saturation with low dry-bulb. A plotting of the wet-bulb isotherms for Australia shows that it has a temperature below 70 F. wet-bulb in winter, and the greater part of it is below 75 F. wet-bulb in summer. Barrett says that this fact accounts for the good health enjoyed by the inhabitants in general and the low death-rate. It does not, however, account for the defective health of the women, which Barrett attributes in part at least to the high wet-bulb temperature of the kitchens and houses, as ascertained by actual tests in a number of cities and towns, a condition which should be easily remedied by the application of scientific knowledge at hand.

The whole fabric of modern curative medicine, Barrett believes, approaches the ridiculous because well-known scientific principles of prevention are not applied. He takes the view that it is more important to apply knowledge already existing than to seek for further knowledge, and that it is futile to enlarge the boundaries of knowledge by recon-dite research if no attempt is made to put the knowledge we have to practical use.

The Short Road to Success

We have, at various times, commented on the foreign opinion of American physicians and the brazen effrontery with which it is attempted to foist proprietary preparations on American physicians. More recently space has been given to a discussion of the so-called "painless childbirth" method of Freiburg, now being exploited by an American magazine. In view of this situation, the following comment by an American medical journal (the *Cleveland Medical Journal*) seems exceedingly appropriate:

"With the recent acknowledgment from *McClure's Magazine* (THE JOURNAL A. M. A., June 13, 1914, p. 1912) that their article, "Painless Childbirth," was technically correct and read by Professor Krönig and Doctor Gauss, we feel tempted, along with others, to lament the changes coming over many of the German medical men of to-day. The old German ideals of deep study, of verity and of thoroughness—what, may we ask, is becoming of them? Much of the German medical literature of to-day is flooded with superficial studies and absurd deductions on this, that and the other subject intended to attract the public eye. At Berlin and Vienna are arranged elaborate postgraduate courses of from one to four weeks or longer, principally shorter. They are ground out to your order, in English or German, at so many "simoleons" per minute and at the end, a much embossed, much begilded diploma will be duly handed out to the participant. We are glad to say that this does not apply to the work of many of the worthy professors in these great founts of medical knowledge, but sad to relate it is only too true of many of the courses offered. And what is even worse, Americans are the particular game and laughing stock of all too many of those privat-dozents, ausserordentlich professors, geheimrats, et cetera. American medicine has not yet recovered from the shock of Friedmann's Golden Fraud and we are pained to learn that Professor Krönig would also add his name to those men desiring dollars rather than wisdom and the honor of their fellow workers. We say this in spite of the recent denial from him as given in the *Lancet Clinic*. The German medical man has but to put a few titles before his name, appear in America and he feels himself called upon to burst out in public print to his heart's desire and his pockets overflowing—witness the example of a noted orthopedist a few years ago and just lately of an aurist. It is said that our remarkable antisyphilitic remedy, salvarsan, costs nine marks (about two dollars) a kilogram to manufacture and is sold to the public at the moderate price of nine thousand marks (about two thousand dollars) per kilogram. True, it is also said, that all the profits are turned over to the institute at Frankfurt; but what, might we ask, would happen if the Rockefeller or Pasteur Institute should adopt such tactics with so valuable a remedy? Think of the hundreds and hundreds of dispensary patients denied this drug because of its prohibitive cost. Is it possible that the German med-

ical man of to-day is, in his desire for material gain, forgetting the higher ideals of research, of teaching others and of healing the sick? There is much food for thought for his American colleagues and we deeply hope that medical Germany will take no chance to besmirch that high reputation of which she can be so justly proud."

Cleansing and Disinfection of Railroad Coaches

The usual carelessness of the traveling public and the close contact necessitated in railroad travel make the sanitation of railroad coaches an important problem in disease prevention. The railroads entering Asheville, N. C., a resort containing many sanatoriums for the care of tuberculous persons, have a method of disinfecting and cleaning their sleeping-cars and day coaches and their contents which is well devised and seems to be good enough to serve as a model. The procedure is described by A. D. Foster in *Public Health Reports*, March 27, 1914. Asheville is a division terminus and cars entering that place lie over for twelve hours, during which they are cleaned and disinfected. Sleeping-cars, day coaches and baggage-cars are switched to a special track, where the ventilators, windows and doors are tightly closed and the cars are fumigated with formaldehyd gas. The gas is generated in three galvanized iron pails for each car, each pail containing 500 c.c. commercial formaldehyd and 250 gm. potassium permanganate. In sleeping-cars all berths are taken down, and blankets, pillows and mattresses are opened and spread out so that the gas may have access to them. The car remains closed for about twelve hours. All carpets, upholstered seats and backs, blankets and pillows are then removed from the car and placed in the air and sun outside. Dust is removed from the removable seats, backs and carpets by means of compressed air, and similar cleansing of the interior of the car is performed. The floor of the car is then scrubbed with soap and hot water and the remainder of the woodwork is wiped with damp cloths. Drinking-water tanks and spittoons are removed, cleaned and scrubbed inside and out with brush and scouring-soap, rinsed with clean water and then sterilized with live steam. A small quantity of formaldehyd is placed in each spittoon. Once a month the tanks used for storing water for wash-rooms and water-closets are flushed and cleansed, and hoppers are cleansed with an acid solution. Woolen blankets are periodically shipped to special laundries where they are washed and combed. Day coaches and baggage-cars are cleaned and disinfected in practically the same way, and special attention is given to the space behind the steam-pipes which run alongside the coaches, a favorite place for expectation by passengers. This is scrubbed with hot water and soap and then scalded with live steam. The procedures described seem to be fairly effective methods of cleaning, and much in advance of those usually employed. For the proper protection of the public similar methods might properly be demanded everywhere.

Dual Responsibility of Physicians Connected with State Institutions

The supreme court in Vienna has recently decided that medical men connected with the municipal hospitals are liable for damages from malpractice the same as other practitioners elsewhere, as they are personally responsible for their actions in respect to patients. In their capacity of teachers, however, as professors in municipal and state institutions, they are responsible to the state, and they must be regarded as public officials to this extent. The case in which this decision was handed down was the appeal of a former official who had sued Prof. J. Hochenegg and three of his assistants for damages on account of the consequences of an operation on a furuncle. He asked 2,000 (about \$400) kronen and the difference between the salary he formerly received and the pension he was now getting. He lost his case at the first trial as Professor Haberda testified that the operation had been done strictly according to approved rules; and the lawyers pleaded that, in any event, the defendants, being physicians in the public hospital, were thus public officials and the case should be non-suited. The supreme court rejects this legal contention and remands the case for a new trial.

Medicolegal

No Damages for Mental Anguish from Physician's Failure to Attend Wife

(*Adams vs. Brosius* (Ore.), 139, Pac. R. 729)

The Supreme Court of Oregon affirms a judgment for the defendant, who was sued for \$50,000 damages for mental anguish asserted to have been suffered by the plaintiff on account of an alleged breach of contract by the defendant to attend the plaintiff's wife after she had met with an accident which produced a miscarriage. The court says that the doctrine that mental suffering accompanying personal injury or physical pain is always the subject of compensation is so firmly implanted in the jurisprudence of the several states of the Union as to become a legal maxim. In most cases, however, the mental anguish should be connected with the bodily injury and be fairly and reasonably the natural consequence that flows from it, and damages for prospective mental anguish are not recoverable as being too speculative. The sympathetic mental sufferings of the plaintiff on account of the suffering and pain of his wife, caused by the defendant's failure to observe his professional contract, were too remote and inconsequential to be actionable. It is the person who suffers the injuries proximately resulting from the wrong done, and such person alone, who is entitled to compensation, except in cases in which death results and the cause of action is made to survive to relatives, or personal representatives by virtue of the statute. Had death not claimed her for its victim, the plaintiff's wife possibly could have maintained an action against the defendant for the mental anguish and physical pain, if any, which she sustained as a result of the broken contract, but for the plaintiff no action was maintainable for purely mental distress.

Eugenics Law Constitutional

(*Peterson vs. Widule* (Wis.), 147 N. W. R. 966)

The Supreme Court of Wisconsin holds constitutional the eugenics law passed in that state in 1913. The court says, among other things, that the power of the state to control and regulate by reasonable laws the marriage relation, and to prevent the contracting of marriage by persons afflicted with loathsome or hereditary diseases which are liable either to be transmitted to the spouse or inherited by the offspring, or both, must, on principle, be regarded as undeniable. To state this proposition is to establish it. Society has a right to protect itself from extinction and its members from a fate worse than death.

Neither the legislative idea nor the legislative purpose in the passage of the present law can be a matter of serious doubt. The idea plainly was that transmission of the so-called venereal diseases by newly married men to their innocent wives was a tremendous evil, and the purpose just as plainly was to remedy that evil so far as possible by preventing the marriage of men who on examination were found to possess such diseases.

An argument was made that the law is void because the classification is unreasonable, arbitrary and discriminatory, in that it singles out men about to marry and makes a class of them; there being, as it was argued, no substantial differences which suggest the propriety of different legislative treatment between men who are about to marry and women who are about to marry. Theoretically the argument is strong. Women who marry and transmit a loathsome disease to their husbands do just as much harm as men who transmit such a disease to their wives; if women were in fact doing this thing as frequently or anywhere nearly as frequently as men, the argument could hardly be met. The medical evidence in the case, however, corroborates what the court supposes to be common knowledge, namely, that the great majority of women who marry are pure, while a considerable percentage of men have had illicit sexual relations before marriage, and consequently that the number of cases in

which newly married men transmit a venereal disease to their wives is vastly greater than the number of cases in which women transmit the disease to their newly married husbands. It follows that legislation directed against males alone for the purpose of preventing the transmission of venereal diseases is clearly within the police power and just as clearly is not discriminatory.

The court deems it clear that the act as passed was intended to cover only acquired venereal diseases as understood in medical science, and that the form of physician's certificate in the act is to be construed as covering only such diseases.

The act requires physical examination and "the application of the recognized clinical and laboratory tests of scientific search." It seems quite impossible to believe that it was seriously expected that the Wassermann test was to be considered a *sine qua non*. The court prefers to construe the words "recognized tests" as intended to refer to the tests recognized and used by the people who were to make them. This construction sustains the law, makes it reasonable, accomplishes its evident purpose, provides for a guard to marriage fully as effective in the vast majority of cases as the application of the Wassermann test. The court is inclined to the opinion that the fee of \$3 provided by the law is a very meager one; it should not, however, feel justified in holding the law unconstitutional on this ground.

Nor has the court been able to appreciate the contention that the law interferes in any respect with religious liberty.

Treatment Must be Tested by Principles and Practice of Particular School

(*State vs. Smith (Idaho)*, 138 Pac. R. 1107)

The Supreme Court of Idaho says that it seems to be a sound and reasonable rule and well established by the authorities that the treatment of a physician of one particular school is to be tested by the general principles and practices of his school and not by those of other schools, and that a physician or surgeon is bound to exercise such reasonable care and skill as is possessed and exercised by physicians and surgeons generally in good standing of the same system or school of practice or treatment in the locality and community of his practice, having due regard to the advanced state of the school or science of treatment at the time of such treatment. When a patient selects any one of the many schools of treatment and healing to serve him, he thereby accepts and adopts the kind of treatment common to that school or class, and the care, skill, and diligence with which he is treated, when questioned in a court of justice, should be tested by the evidence of those who are trained or skilled in that school or class.

Society Proceedings

COMING MEETINGS

Amer. Assn. of Obstetricians and Gynecologists, Buffalo, Sept. 15-17.
American Electro-Therapeutic Association, Battle Creek, Sept. 15-17.
American Roentgen Ray Society, Cleveland, Sept. 9-12.
Colorado State Medical Society, Boulder, Sept. 8-10.
Indiana State Medical Association, Lafayette, Sept. 24-25.
Kentucky State Medical Association, Newport, Sept. 23-25.
Med. Soc. of the Mo. Valley, Des Moines and Colfax, Ia., Sept. 17-19.
Michigan State Medical Society, Lansing, Sept. 11-12.
Oregon State Medical Association, Portland, Sept. 10-11.
Pennsylvania State Medical Society, Pittsburgh, Sept. 21-24.
Utah State Medical Association, Salt Lake City, Sept. 29-30.
Washington State Medical Association, North Yakima, Sept. 21-23.

The Sound Man.—Health is civic. Sound men will eliminate poverty and that of itself should make us all sanitarians. Sound men will learn to do without jails, recognizing that so-called criminals are properly speaking candidates either for educational reformatory or for a custodial hospital, and therefore again I turn gladly toward the dawn of the new health.—Edward T. Devine in the *Survey*.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Anatomy, Philadelphia

July, XVI, No. 3, pp. 259-369

- 1 Development of Mammary Jugular Lymphatic, of Tributary Primitive Ulnar Lymphatic and of Thoracic Ducts and Hemal Vascular. G. S. Huntington, New York.
- 2 Skull of Human Fetus of Forty MM. C. C. Macklin, Toronto.

American Journal of Tropical Diseases and Preventive Medicine, New Orleans

July, II, No. 1, pp. 1-98

- 3 Late Outbreak of Plague in Havana. A. Agramonte, Havana, Cuba.
- 4 Opportunities and Needs of American Student and Investigator in Tropical Medicine. R. P. Strong, Boston.
- 5 Influence of Tropical Residence on Blood. W. P. Chamberlain, U. S. Army.
- 6 Trachoma. M. V. Safford, Boston.
- 7 Treatment of Trachoma by Grattage. L. Schwartz, Cebu, P. I.

Archives of Internal Medicine, Chicago

July, XIV, No. 1, pp. 1-142

- 8 *An Acid-Fast Streptothrix (Nocardia). D. J. Davis, Chicago.
- 9 *Blood in Inanition. J. E. Ash, Boston.
- 10 *Pathologic Physiology of Circulation During Hemorrhage. C. J. Wiggers, New York.
- 11 *Blood-Pressure in Pneumonia. L. H. Newburgh and G. R. Minot, Boston.
- 12 *Pneumococcus Infection and Lobar Pneumonia. R. Cole, New York.
- 13 *Color-Index of Red Blood-Corpuscles. E. Meyer, Strassburg and E. E. Butterfield, New York.
- 14 *Human Streptothrix and Its Differentiation from Tuberculosis. E. J. Claypole, Berkeley, Cal.
- 15 *Preliminary Report on Production, Action and Therapeutic Effects of Leukocytic Extracts. R. A. Archibald and G. Moore, Oakland, Cal.
- 16 *Comparison of Bang's Micromethod for Determining Blood Sugar with Bertrand's Method. R. Fitz, Boston.

8. **Acid-Fast Streptothrix.**—There is a fairly well-defined group of infections, the great majority of which are pulmonary, caused by weakly acid-fast branching mycelial growths (nocardia) which do not form ray-like granules. These cases clinically are not ordinarily distinguished from pulmonary tuberculosis. A case is cited by Davis in which the pulmonary lesions were very probably caused by such an organism. For the treatment of such cases, he says, potassium iodid should be given in large doses.

9. **Blood in Inanition.**—Ash found that the effects of starvation on the blood are: 1. There is a slight actual loss in hemoglobin, more marked during second ten days. 2. There are moderate fluctuations in water content, particularly during first half of period. 3. There is a decided rise in polymorphoneutrophils in the early days. 4. There is an increase in coagulability, especially after the first two weeks. 5. The blood as a whole is distinctly resistant to the effects of uncomplicated inanition, permitting of entire abstinence from food for long periods of time (at least thirty-one days) without deleterious consequences, as far as the blood is concerned.

10. **Pathologic Physiology of Circulation During Hemorrhage.**—Wiggers states that every hemorrhage, except one coming from a very large vessel, has a natural tendency to be checked long before the loss of blood becomes dangerous. The duration of bleeding depends not so much on the size of the vessels wounded as on the facility with which an efficient clot forms over the opening. When blood is shed, it begins to coagulate on the tissues at a distance from the opening. Having formed a point of adhesion to the tissues, it is added to by accretion until it reaches and covers the wound. The factors which determine the distance of the first clot formation and its development are, therefore, directly concerned with the duration of hemorrhage. Other factors being equal, the pressure at the arterial opening determines the distance that blood will be ejected before the force is sufficiently spent to permit the coagulum to form.

Wiggers has found that the maximal pressure in the systemic as well as in the pulmonary circuit is often entirely determined by the depth of respiration. It is quite possible that a drug which, in a normally breathing animal, increases the cardiac output and causes a rise in the average mean pressure may, nevertheless, by reducing the dyspnea during hemorrhage actually lessen the maximal pressure in the artery. The surface on which blood is shed determines the extent of its spread. Thus, the smooth surface on which the intestinal and uterine vessels rupture compares unfavorably with the reticular lung parenchyma and subcutaneous connective tissue. So, also, the spread may be limited by an ulceration or excavation.

The coagulation time directly influences the course of clot formation. The formation of clots may be retarded or prevented by muscular contractions of organs. The regular cardiac contraction, as a rule, absolutely prevents any clot formation over wounds of the heart and forms the only serious element in such wounds. The rhythmic peristalsis in the stomach and intestines are very unfavorable for clot formation and the induction of these movements in the intact abdomen by injections of epinephrin may possibly be sufficient to counterbalance any such favorable vascular influence. On the other hand, the only hemostatic value of atropin resides in its power to inhibit muscular movements and its use in conjunction with vascular agents such as epinephrin in hemorrhage from muscular organs is physiologically indicated especially, as the increasing percentage of carbon dioxid in the blood itself tends to increase the rhythmic contraction of organs. When hemorrhage terminates favorably by coagulation, the volume of blood returned to the right auricle increases with surprising rapidity. In consequence of the better venous supply and greater output of both ventricles, the pulse-pressure increases, for there is little alteration in the peripheral resistance and the increase in the volume elasticity coefficient remains an almost negligible factor. Both systolic and diastolic pressures thus gradually rise, owing to the augmented cardiac output.

All experimental observations made by the method described by Cope have indicated to Wiggers that vasoconstriction is a gradual process, starting while hemorrhage is still in progress and continuing after its cessation. If coagulation fails to occur, the time soon comes when the reduction in blood-volume exceeds the possibilities of lymph absorption, to such an extent that the mechanical function of the circulation cannot be efficiently carried out. The amplitude of cardiac contraction then decreases, largely because fluid is lacking to feed the pump. The reasons for saline infusion or blood-transfusion is obvious. Epinephrin also favors the rapidity of cardiac contraction in such cases and so improves the arterial pressure. The lack of oxygen in the blood soon changes the previous stimulation of the respiratory center to a depression. Slow and shallow breathing, occasionally marked by a deeper gasp, leads to complete cessation. The "pressor influence" of augmented breathing is removed and the blood-pressure falls rapidly. Asphyxial changes in the circulation terminate the case. The heart-beats are slow but of great amplitude and vigor, thus making a last attempt to elevate the pressure, which is partly successful but soon fails for want of oxygen.

11. Blood-Pressure in Pneumonia.—The blood-pressure curve does not suggest to Newburgh and Minot that there is a failure of the vasomotor center in pneumonia, nor are low systolic pressures "invariably of evil omen." The systolic pressure in the fatal cases tends to be higher than it is in the recoveries. Blood-pressure measurements in pneumonia cannot be used as a basis for treatment. Prognostic inferences based on the relation of the level of the systolic pressure curve to the pulse curve (Gibson's rule) are wrong more often than they are right. The rate of the pulse and not the level of the pressure is the chief factor in deciding whether the pressure will fall above or below the pulse. The pulse-pressure data secured by the authors are insufficient in number to justify conclusion.

12. Pneumococcus Infection and Lobar Pneumonia.—That the symptoms in pneumonia are probably due to toxic substances derived from the bacterial cells is the belief held by Cole. The outcome is dependent on the virulence of the organisms concerned and on the ability of the body, first to limit the local infection, and second, to prevent the invasion of the blood by the organisms, as on the latter the outcome of the disease mainly depends. Cole also believes that leukocytes probably play a part in the resistance, certainly as regards the local spread and probably also to some extent as regards the general infection. The most important part in prevention of the general infection is probably played by immune substances contained in the serum. Such substances are present in the serum of immunized animals. Pneumococci differ in regard to their immunologic reactions and on these they may be divided into several groups. In order to use immune serum effectively in treatment, as in prevention, Cole states, it is necessary to employ the serum effective against the group of organisms to which the special organism causing the infection belongs. Immune serums effective against two of the most important groups have been produced. This treatment has been carried out in a limited number of patients with promising results. It is probable that the methods of application of such serums will be improved, and it is possible that the method may be combined with other measures directed toward other factors which are important for the outcome. In any case, facts regarding the nature of the disease are being disclosed, and the outlook, at least for lessening the ravages of this dreadful disease, is encouraging.

13. Color-Index of Red Blood-Corpuscles.—The high color-index in pernicious anemia Meyer and Butterfield state is due to an increase in the oxyhemoglobin content of the erythrocytes. A quantitative study of the light absorption shows that oxyhemoglobin alone and no other derivative of hemoglobin is present in the blood of cases of pernicious anemia with a high color-index. The color-index of normal human blood varies within the narrow limits of 0.9 to 1.1. The average total hemoglobin concentration of normal defibrinated human blood is in the neighborhood of 16 gm. in 100 c.c. The color of the red blood-corpuscles is best explained by the principle of dichromatism as applied to the absorption spectrum of oxyhemoglobin.

14. Streptotrichosis and Its Differentiation from Tuberculosis.—Claypole holds that streptotrichosis is more common than generally supposed and frequently not differentiated from other infections; especially is it confused with tuberculosis. Clinical signs are not characteristic enough to determine the diagnosis accurately, therefore discharges—sputum, pus, etc.—should be carefully examined fresh in as large quantities as possible, and smears stained with carbolfuchsin and Gram stains. The amount of decolorization in the carbolfuchsin preparations should be varied so as to differentiate the less acid-fast types. Streptotrichins (glycerinated bouillon cultures, concentrated), made from the non-acid-fast mycelial and partly acid-fast bacillary organisms, give definite skin reactions on persons with frank infections, but do not show on controls (persons presumably non-infected) including cases of recognized tuberculosis. This either shows the infection to be less general than that due to the tubercle bacillus or else the reaction to be a less long-lasting one. Streptotrichosis and tuberculosis may exist in the same person at the same time, as evidenced by the appearance of both organisms in the sputum and both skin reactions. Gland and bone infections with streptotriches may be demonstrated by skin reactions as well as lung infections. This still further broadens the field for confusion between the tuberculosis and streptotrichoses.

15. Action and Therapeutic Effects of Leukocytic Extracts. Leukocytic substances possessing positive therapeutic value were procured by Archibald and Moore from leukocytes obtained directly from the blood of normal animals. These substances may be obtained in quantities which render them not only therapeutically practical but commercially possible,

conditions that can hardly be claimed for leukocytic extracts prepared from inflammatory leukocytes. The parenteral injection of leukocytic substances causes profound changes in the blood, producing a marked leukocytosis and marked changes in the individual leukocytes. As to the significance of these phenomena no opinion can be offered at this time. The authors hold that leukocytic extracts have not sufficient direct bactericidal powers to account for the profound changes produced following their parenteral introduction into an animal suffering from an infectious disease, and the beneficial results obtained are probably due to the fact that the extracts furnish elements which stimulate the fatigued or exhausted leukocytes, enabling them to carry on their function of phagocytosis and produce the changes incidental thereto.

16. **Bang's Micromethod for Determining Blood-Sugar with Bertrand's Method.**—Comparative experiments by Fitz show that the results obtained by the micromethod were not absolutely accurate if the results obtained by the Bertrand method are considered correct. In a series of forty-two determinations by both methods, however, in only two cases was there a difference of more than 0.03 gm. per 100 c.c. of blood. This means that, while the absolute error was large, the relative error was slight. The curve of blood-sugar determinations made from all the examinations was closely parallel. Hence for comparative and repeated studies in blood-sugar estimations the micromethod is admirable. Furthermore, since the amount of blood required to make the test is so small, and the technic so simple, the method affords an excellent clinical means for the estimation of blood-sugar.

Arizona Medical Journal, Phoenix

July, II, No. 6, pp. 5-14

- 17 Postoperative Treatment of Our Abdominal Cases. A. W. Morton, San Francisco.

Arkansas State Medical Society Journal, Little Rock

July, XI, No. 2, pp. 35-59

- 18 Evolution of Knowledge Pertaining to Syphilis. A. H. Cook, Hot Springs.
19 Malignant Degeneration of Skin Blemishes. W. R. Bathurst, Little Rock.
20 Syphilis of Kidneys. Report of Cases. E. H. Martin and E. A. Purdum, Hot Springs.
21 Tests of Renal Function. W. H. Deaderick, Hot Springs.

Boston Medical and Surgical Journal

July 30, CLXXI, No. 5, pp. 177-216

- 22 Cesarean Section. Analysis of Sixty Cases. T. F. Greene, Boston.
23 Fasting Metabolism of Infants. H. Murschhauser, Dusseldorf, Germany.
24 Myatonia Congenita. Report of Case. C. H. Dunn, Boston.
25 Pneumothorax for Hemoptysis. E. von Adelung, Oakland, Cal.

Florida Medical Association Journal, Jacksonville

July, I, No. 1, pp. 1-32

- 26 Organized Medicine and Legislation. J. H. Pierpont, Pensacola.
27 Karell-Kur. T. Truelsen, Tampa.
28 Diagnosis and Treatment of Venereal Ulcer. W. P. Dey, Jacksonville.
29 Sand-Spur in Larynx—Its Removal, Report of Two Cases. C. D. Christ, Orlando.

Journal of Biological Chemistry, Baltimore

July, XVIII, No. 2, pp. 133-327

- 30 *Rate of Disappearance of Ammonia from Blood in Normal and in Thyroidectomized Animals. C. Jacobson, Chicago.
31 Basal, Gaseous Metabolism of Normal Men and Women. F. G. Benedict, L. E. Emmes, P. Roth and H. M. Smith, Boston.
32 Purin Enzymes of Orang-Utan (*Simia Satyrus*) and Chimpanzee (*Anthropo-Pithecus Troglodytes*). H. G. Wells and G. T. Caldwell, Chicago.
33 Soluble Polysaccharides of Lower Fungi. 1. Mycodextran, New Polysaccharide in *Penicillium Expansum*. A. W. Dox and R. E. Neidig, Iowa.
34 Contribution of Bacteria to Feces after Feeding Diets Free from Indigestible Components. T. B. Osborne and L. B. Mendel, New Haven, Conn.
35 *Preparation of Creatin and Creatinin from Urine. S. R. Benedict, New York.
36 *Estimation of Creatin. S. R. Benedict, New York.
37 Origin of Urinary Creatin. S. R. Benedict and E. Osterberg, New York.

- 38 Estimation of Phosphorus in Biologic Material. A. E. Taylor and C. W. Miller, Philadelphia.
39 *Synthesis and Rate of Elimination of Hippuric Acid after Benzozate Ingestion in Man. H. B. Lewis, Philadelphia.
40 *Formation of Glucose from Dioxycetone in Diabetic Organism. A. I. Ringer and E. M. Frankel, Philadelphia.
41 Conjugated Sulphuric Acid from Tendomucoid. P. A. Levene and F. B. La Forge, New York.
42 *Metabolic Relationships of Acetone Substances. W. M. Marriott, St. Louis.
43 Turbidity Methods for Determination of Acetone, Acetoacetic Acid and B-Oxybutyric Acid in Urine. O. Folin and W. Denis, Boston.
44* Quantitative Determination of Albumin in Urine. O. Folin and W. Denis, Boston.
45 Metabolism in Bence-Jones Proteinuria. O. Folin and W. Denis, Boston.
46 Importance of Liver in Urea Formation from Amino-Acids. C. H. Fiske and J. B. Sumner, Boston.
47 *Volumetric Method for Estimation of Total Sulphur in Urine. G. W. Raiziss and H. Dubin, Philadelphia.
48 Vicine. P. A. Levene, New York.
49 *Iodin Content of Tuberculous Tissues. P. A. Lewis and R. B. Krauss, Philadelphia.
50 Case of Pentosuria. P. A. Levene and F. B. La Forge, New York.

30. **Disappearance of Ammonia from Blood.**—Even with the kidneys excluded from the circulation Jacobson found that ammonia injected into the blood is so rapidly removed from it that only a very slight excess is present five minutes after the injection. There is only a very slight difference between the normal and parathyroidectomized animal in the rate of disappearance of the ammonia from the blood.

35. **Preparation of Creatin and Creatinin from Urine.**—An interesting point in connection with the process described by Benedict is that it was originally tried as an expeditious method for the preparation of pure creatin. Instead of yielding creatin, perfectly pure creatinin was obtained. Following is the procedure: The recrystallized creatinin zinc chlorid (which should be finely powdered) is placed in a dry flask and treated with seven times its weight (by volume) of concentrated aqueous ammonia. The mixture is slightly warmed and gently agitated by shaking until a clear solution is obtained, care being taken to drive off no more ammonia during the warming than is necessary to obtain a clear solution. The flask is stoppered, allowed to cool, and then placed in an ice-box for an hour or more. Pure creatinin crystallizes out, and the first product obtained by this process should read 100 per cent. colorimetrically. The yield is from 60 to 80 per cent. of the theoretical. If the product is colored slightly yellow it may be recrystallized either from boiling alcohol, or by dissolving in five times its weight (by volume) of concentrated ammonia (warming enough to effect solution) and letting the solution stand in a cold place for some hours. Recrystallization is usually unnecessary. The product is perfectly pure, and may be used as a standard. Benedict adds that creatin is not converted at all to creatinin by warming with concentrated ammonia. So it would appear that this latter solution is perhaps the only aqueous solution in which either creatin or creatinin may be dissolved without any change from one into the other.

36. **Estimation of Creatin.**—The procedure for the determination of creatin in urine devised by Benedict is as follows: Such a volume of urine as will contain between 7 and 12 mg. of total creatinin is introduced into a small flask or beaker and from 10 to 20 c.c. of normal hydrochloric acid are added, together with a pinch or two of powdered or granulated lead. The mixture is boiled over a free flame as slowly or as rapidly as may be desired until very nearly down to dryness, when the heating should be continued to dryness either on a water bath, or very easily by simply holding the vessel in the hand and heating carefully for a moment or two. The residue should best stand on a water bath for a few minutes until most of the excess of hydrochloric acid gas has been expelled, after which it is dissolved in about 10 c.c. of hot water and the solution rinsed quantitatively through a plug of cotton or glass wool (to remove all metallic lead) into a 500 c.c. volumetric flask. Twenty to 25 c.c. of saturated picric acid are added, and about 7 to 8 c.c. of 10 per cent. sodium hydroxid solution

which contains 5 per cent. of Rochelle salt. The flask is filled to the mark at the end of five minutes and read as usual.

39. **Synthesis of Hippuric Acid.**—Lewis states that in man after the administration of from 6 to 10 gr. of sodium benzoate elimination as hippuric acid takes place very rapidly, 85 to 90 per cent. of the ingested benzoate being excreted in from five to six hours. The rate of elimination of hippuric acid after the administration of sodium benzoate is only slightly less rapid than after the administration of hippuric acid. After benzoate ingestion, the urine collected during the first six months, the period during which the greater part of the hippuric acid is being excreted, has a lower urea plus ammonia content than in a normal control period, indicating that hippuric acid nitrogen is derived at the expense of the nitrogen normally eliminated as urea.

40. **Formation of Glucose from Dioxycetone.**—Four experiments were performed by Ringer and Frankel in which dioxycetone was administered subcutaneously to phlorizinized dogs. In every case a rise in the glucose elimination followed. The "extra" glucose in one experiment corresponded to an amount of glucose which would arise if all of the carbon of dioxycetone were converted into glucose. The effect of dioxycetone on acidosis is decidedly anti-ketogenetic in three of the four experiments. Dioxycetone was found in the urine in unchanged form in only one of the four experiments. In that case the urine reduced Fehling's solution in the cold and reacted positively with the Miller-Taylor reagent. In none of the other experiments did dioxycetone appear in the urine.

42. **Metabolic Relationships of Acetone Substances.**—The behavior of acetoacetic acid, *l*- and *dl*-oxybutyric acids and butyric acid, in the metabolism was studied by Marriott by means of incubation experiments on hashed organs, and by parenteral introduction into normal and phlorizinized dogs and young pigs. The analytic results obtained from individual organs, the circulating blood, and the urines have led to the following conclusions: 1. Acetoacetic acid can be readily converted into *dl*-oxybutyric acid in the organism, but the reverse change is difficult, and probably not accomplished under normal conditions. 2. The dextro component of *dl*-oxybutyric acid can be utilized even by the diabetic organism, and this is the explanation of the appearance only of *l*-oxybutyric acid in diabetic urines. 3. The normal path of fatty acid catabolism is as follows: Fatty acid—(butyric acid?)—acetoacetic acid—*d*-oxybutyric acid (readily burned) *l*-oxybutyric acid (difficultly burned).

44. **Estimation of Albumin in Urine.**—The principle of the turbidity method described by Kober for the determination of proteins in milk and in digestion mixtures as used by Folin and Denis for the determination of albumin in the urine is as follows: To about 75 c.c. of water in each of two 100 c.c. volumetric flasks is added 5 c.c. of a 25 per cent. solution of sulphosalicylic acid. A second method, the gravimetric determination of albumin in urine is described as follows: Ten cubic centimeters of urine are pipetted into an ordinary conical centrifuge tube which has been previously weighed. To this urine is then added 1 c.c. of 5 per cent. acetic acid and the tube allowed to stand for fifteen minutes in a beaker of boiling water. At the end of this time the tube is removed from the water bath and centrifuged for a few minutes. The supernatant liquid is then poured off, the precipitate in the tube is stirred up with about 10 c.c. of boiling 0.5 per cent. acetic acid and again centrifuged. The supernatant liquid is then again poured off and the precipitate in the tube again washed, this time with 50 per cent. alcohol. After centrifuging and pouring off the supernatant liquid for a third time the tube is placed for two hours in an air bath at 100 to 110 F., then cooled in a desiccator and weighed.

47. **Volumetric Estimation of Sulphur in Urine.**—This method has for its basis, the estimation of benzidin in the precipitate of benzidin sulphate, rather than the sulphuric acid.

49. **Iodin Content of Tuberculous Tissues.**—Tuberculous tissue derived from animals to which no iodine preparation has been knowingly administered Lewis and Krauss state may contain amounts of iodine very appreciably higher than normal control tissue of the same animal. While it is quite probable that tuberculous tissue in animals treated with iodine products may store up iodine, this has been by no means clearly shown in any experiments so far reported. The highest figures for the tuberculous tissue of untreated animals in their experience may equal the highest figures of those reported by others as evidence for the localization in the tissue of iodine intentionally administered.

Journal of Cutaneous Diseases, New York

July, XXXII, No. 7, pp. 481-544

- 51 Lichen Planus of Tongue Alone. D. W. Montgomery, San Francisco.
- 52 Industrial Skin Diseases. H. H. Hazen, Washington, D. C.
- 53 Cheilitis Exfoliativa. H. K. Gaskill, Philadelphia.

Journal of Nervous and Mental Diseases, Lancaster, Pa.

July, XLI, No. 7, pp. 417-488

- 54 Paramyoclonus Multiplex, Including Case with Necropsy Showing Lymphocytic Infiltration of Pia. E. M. Williams, Sioux City, Ia.
- 55 Case of Pure Psychic Epilepsy. E. S. Abbot, Waverly, Mass.
- 56 Relative Weight of Liver and Brain in Psychoses. A. Myerson, Boston.

Lancet-Clinic, Cincinnati

July 18, CXII, No. 3, pp. 61-88

- 57 Remarkable Cases of Morphin Habit. E. M. Strasser, Cincinnati.
- 58 Doctor. H. R. Alburger, Indianapolis.
- 59 Treatment of Syphilis of Nervous System by Means of Salvarsanized Serum *in Vivo*; Ninety-One Injections in Twenty Cases. R. B. H. Gradwohl, St. Louis.

July 25, No. 4, pp. 89-116

- 60 Results from Cultivation of Neglected Field. J. H. Radley, New York.
- 61 Interpretation of Roentgenograms. R. H. Boggs, Pittsburgh.
- 62 Adenoids. C. C. Jones, Cincinnati.

Medical Record, New York

August, 1, LXXXVI, No. 5, pp. 187-232

- 63 Serum Treatment of Pneumonia. J. C. Roper, New York.
- 64 Case of Sigmoid Diverticulitis Simulating Malignancy. R. Abbe, New York.
- 65 Ulcer of Lesser Curvature. J. R. Verbrycke, Jr., Washington, D. C.
- 66 Primary Carcinoma of Vagina Treated by Radium and Roentgen Rays. I. Levin, New York.
- 67 Case of Volvulus of Jejunum-ileum with Anterior Gastro-enterostomy. W. E. Tolic, Portland, Me.
- 68 Apparatus for Neurovascular Training. Simon Baruch, New York.
- 69 Conservatism in Treatment of Disease. B. Robinson, New York.
- 70 Socialization of Medical Training and Practice. I. C. Philbrick, Lincoln, Nebr.
- 71 Spinal Subluxations; Their Nature and Cause. J. H. Radley, New York.
- 72 *Organism of Small-Pox, Chicken-Pox, and Vaccinia. H. Greeley, Brooklyn.

72. **Organism of Small-pox, Chicken-pox and Vaccinia.**—Greeley noted that in fluid vaccine virus, by hanging-drop observation, one might frequently see large numbers of motile bodies and that the same, no matter what vaccine virus was used, could be obtained from the vesicles of the inoculated. They stained with Giemsa, Neisser and Unna stains. The organism is evidently a sporothrix. In the form of multiplying spores (thus in vaccine virus and in all papules, vesicles and pustules) it is spherical, its diameter varying in the neighborhood of from 0.3 to 0.6 microns. When actively multiplying all present a nucleus which takes the usual anilin dyes with varying facility. A frequent form is a pneumococcus-like couplet which, when stained by Neisser's method, shows a colorless refractile capsule with slightly pink lining, of figure 8 shape, and, within, a blue-stained nucleus in each section—the two nuclei often connected by a bridge of pink whose intensity varies inversely with the distance between nuclei. When these nuclei are nearest together (cell just dividing) the pink is very intense. In all skin lesions the spores multiply, as stated, developing into branching masses whose units are the same as in the figure 8 shape described. These conglomerations often show,

projecting from the extremity of a branch, highly refractile, non-stain-taking spores, borne on the end of a little stem. Several are sometimes seen at the end of the same branch, and often two connected in dumb-bell form. These spores when detached are actively motile, the stem becoming the single flagellum possessed. Muir's or Van Ermengem's flagellum staining method will demonstrate. Greeley states that these spore bodies are evidently the "*Cytoryctes variolae*" described by Councilman and others. They divide and give rise in skin lesion and in culture to the formations aforementioned.

Under certain cultural conditions (which are being studied and will be reported later) a full mycelial growth develops with hyphae and terminal spores. Greeley suggests that this is probably what occurs on the mucous membranes (nasal for instance) in the beginning of these diseases, and the spores, penetrating into the blood-vessels, are wafted to all parts of the system, landing in the skin capillaries in which conditions of lower temperature and more light, perhaps, favor further proliferation. In this connection we should remember how the eruption favors the face and hands.

The organism is gram positive—nucleus purple, capsule sometimes light pink—and when stained with carbol-fuchsin is slightly resistant to decolorization with dilute acid, nucleus resists 10 per cent. acetic well. Organisms will not produce a macroscopic growth on any known solid media, aerobically or under hydrogen. It readily passes Berkefeld laboratory filter No. 5. Cultivation has been successful enough to permit the second generation derived from a specimen of the market's vaccine virus to give one take out of two human inoculations. An apparently identical organism has been obtained from the vesicles of twenty-five cases of successful vaccination, from a like number of cases of undoubted chicken-pox, and from five cases of recognized and unquestionable small-pox.

New Jersey State Medical Society Journal, Orange

July, XI, No. 7, pp. 325-378

- 73 Medical Problems. E. Hollingshead, Pemberton.
- 74 Pathology Underlying Abdominal Symptoms. J. B. Deaver and D. B. Pfeiffer, Philadelphia.
- 75 Roentgenologic Study of Alimentary Canal. W. H. Axford, Bayonne.
- 76 Fractures. H. B. Costill, Trenton.

New Mexico Medical Journal, Las Cruces

July, XII, No. 4, pp. 101-127

- 77 Oil-Ether Colonic Anesthesia. W. W. Spargo, Albuquerque.
- 78 Treatment of Abortion. W. Howe, E. Las Vegas.
- 79 Operative Technic. S. D. Swope, Deming.

New York Medical Journal

August 1, C, No. 5, pp. 205-252

- 80 Typhoid in Early Life. J. P. C. Griffith, Philadelphia.
- 81 *Cardiac Headache. L. Kolipinski, Washington, D. C.
- 82 Constitutional States in Relation to Gynecologic Conditions. R. S. Morton, New York.
- 83 *Four Unusual Obstetric Complications. J. C. Applegate, Philadelphia.
- 84 Treatment of Scarlet Fever. H. C. Becker, New York.
- 85 *Eosinophilia in Chorea. S. S. Leopold, Philadelphia.
- 86 Necessity for Cooperation of Medical Profession in Successful Treatment of Pyorrhea Alveolaris. D. B. Freundlich, New York.
- 87 New Electric Ophthalmoscope. C. H. May, New York.

81. Cardiac Headache.—The prime indication in the treatment of a headache or its analogue, a facial neuralgia from a weak or weakened heart, Kolipinski says, is to strengthen, support, or, if possible, to restore it to normal. This can alone be done where the many acts in life which overtax this heart and weaken it still more, are persistently and intelligently avoided. Where eyestrain is found glasses must be used. If obesity is present the weight must be brought to normal. If tobacco is used it must be given up. This applies in every case of cigarette smoking and to this petty and enfeebling vice when practiced by females. The weakened heart of chronic nicotine poisoning is a counterpart or double of organic myocardial weakness, and it is impossible to separate or distinguish one morbid state from the other until the tobacco poisoning is eliminated.

Rest of the body must be practised as a daily system. One who works must retire at 9 or 10 o'clock and arise at 7. For one incapable of work or who lives retired, the afternoon rest must never be omitted. Afternoon sleep indicates accurately and absolutely a marked degree of exhaustion. Sleep or drowsiness in the afternoon does not occur when the subject possesses more muscle tone and strength, i. e., a stronger heart. Where the afternoon rest is not taken, where the patient is engaged in business or work, the daily hours of lying down should still be as long as possible. Twelve continuous hours of rest are not as helpful as the same number of hours of the afternoon and night. The afternoon rest, which is an adaptation of the tropical siesta, a physiologic habit, is of great benefit in the treatment of all heart diseases not in an acute or grave condition.

Medicinal treatment is essential to cure a chronic headache. There are two remedies of similar action which will accomplish this. Digitalis is the first. It should be given in a single dose, repeated in one or two days, and continued for months and years. The powder of the leaf, its tincture, fluid extract or infusion may be prescribed. Rest and digitalis cure cardiac headache. Even improvement or occasional cure results, but the obstinacy of this afflicting malady is so inveterate that the patient does not receive fair and full attention where they are not combined. Now and again digitalis fails or must be given with sodium iodid to regulate the pulmonic circulation. Where digitalis does not help, the substitute for the time is strophanthus; with arterial sclerosis, aortic valve defects, pulmonary engorgements, strophanthus and sodium iodid. Strophanthus in a few instances replaces digitalis. Sometimes digitalis must be suspended and strophanthus given instead until the heart again becomes susceptible to digitalis. Strophanthus acts best with laxative or purgative drugs. In fact, the strophanthus action, with free movements of the bowels and vomiting, is no disadvantage when it is given for cardiac asthma, lung edema or similar states of other viscera. An efficient remedy for a severe paroxysm of cardiac headache will be found in 2 grains of caffein citrate in a teaspoonful of aromatic elixir every fifteen or thirty minutes till relief is felt.

83. Obstetric Complications.—The first report Applegate makes is one cesarean section including hysterectomy, under spinal anesthesia, eighteen hours after complete rupture of the uterus at term. The second report is of a patient with fibromyxomatous degeneration of the chorion associated with an anomalous fetus, partially macerated, with hare-lip, cleft palate, ankylosed shoulder and elbow joints, and ascites. The diagnosis of placenta praevia had been made by the family physician, and it proved to be the marginal type. The third case was one of multiple subserous fibroids of the uterus, complicating pregnancy; hysterectomy was performed at the third month of gestation. Under ether inhalation anesthesia, the patient left the hospital in three weeks in good condition. The fourth case was one of placenta praevia centralis at the beginning of the eighth month. Cesarean section was performed under spinal anesthesia.

85. Eosinophilia in Chorea.—Leopold studied the blood in twenty cases of chorea. Of the twenty cases a distinct eosinophilia varying from 4 to 16 per cent. was present in ten (50 per cent.). There were nine patients showing recurring attacks of chorea. The number of attacks varied from two to five. Eosinophilia was found in six of the nine patients (66½ per cent.). Four of the nine patients showing recurring attacks of chorea had only a single recurrence. Of these four cases, eosinophilia (4 per cent.) was present in one. The three remaining cases did not show eosinophilia. In one the diagnosis was very doubtful. The five remaining cases showed from three to five distinct recurrences; eosinophilia ranging from 6 to 16 per cent. was present in every case.

There were eleven cases in which the blood was studied during or after the first attack. Three of these were not considered, because in one the diagnosis was extremely

doubtful, and in the other two there was no chorea perceptible at the time the blood examination was made, although the patients had apparently recovered from true chorea. None of the three showed eosinophilia. Of the eight remaining cases studied in the first attack, eosinophilia, ranging from 4 to 6 per cent., was present in four (50 per cent.). In none were the eosinophils higher than 6 per cent., whereas in the recurring cases 13, 15 and 16 per cent. were observed.

New York State Journal of Medicine

July, XII, No. 7, pp. 339-358

- 88 Surgical Treatment of Empyema. C. N. Dowd, New York.
- 89 Antityphoid Vaccination in Childhood. F. F. Russell, U. S. Army.
- 90 Surgery of Acute Suppurative Spreading Infections of Fingers and Hands. W. B. Brinsmade, Brooklyn.
- 91 Causes and Treatment of Eczema in Infancy and Childhood. R. G. Freeman, New York.
- 92 Puerperal Thrombophlebitis. W. M. Brown, Rochester.
- 93 Use of Modified Champetier De Ribes Bag in Obstetrics. G. L. Brodhead, New York.
- 94 Vaginal Discharge. F. McMorro, Syracuse.
- 95 Ectopic Pregnancy. H. P. Jack, Hornell.
- 96 Syphilis as Complication of Pregnancy. W. T. Getman, Buffalo.
- 97 Economic Importance of Diseases of Ear in School Children. J. E. Sheppard, Brooklyn.
- 98 Unification of Child Welfare Forces. S. Block, Brooklyn.
- 99 Gonorrheal Vaccines. S. M. Strong, Brooklyn.
- 100 Injury to Shoulder. I. M. Slingerland, Fayetteville.

91. Eczema in Infancy.—The eczema of infancy and early childhood which, Freeman states, is occasionally due to external irritation is usually caused by gastro-enteric derangement and must be attacked primarily by correcting that derangement. The food should be cut down to the caloric requirements, the ration should be balanced and digestion aided. Stewed fruits and cream should be prohibited. The parts affected should be kept well covered with non-irritating applications.

94. Vaginal Discharge.—In ordinary cases of cervicitis (not of gonorrheal origin), the application of strong solutions of 20 per cent. and 30 per cent. solution of nitrate of silver, tincture of iodine or pyroligneous acid, after first clearing out the mucus from the cervical canal by an alkaline solution, McMorro says, will sometimes effect a cure, but healing by medicament is rare—only in cases in which the necks of the glands are wide open and an application can get in. In the majority of cases local applications provoke new formations of stratified epithelium, which may cover or bridge over the mouths of the glands, causing a false or pseudo healing. The glands are still active and secreting mucus; generally two weeks later, rupture of the glands takes place and cervical discharge commences.

When an operation is inadvisable, an effective method of treating these bad cervical infections, is by the use of actual cautery, heated to a bright red heat introduced well into the cervical canal, making five or six deep radial strokes at each treatment, not attempting to burn out all the diseased tissue at one sitting; this treatment should be repeated in three weeks and a sterile strip of gauze is left in the vagina to take care of possible hemorrhage. McMorro employed this plan of cauterization with good results, noticing a marked improvement and lessening of the discharge after each application. These cauterizations do not even call for a local anesthetic except in weak and nervous women, then it is well to inject a few drops of a 4 per cent. solution of cocaine into the cervix; the patient is able to leave the office afterward with very little discomfort.

The best method of treating most of these infections in McMorro's experience consists in dilating the cervix and with a sharp curet, strongly applied to the diseased cervical glands, eradicate them from the dense matrix by which they are surrounded; this method at least lays the mouths of the glands wide open and drains them. This treatment is generally curative and satisfactory. A trachelorrhaphy will often give relief if done thoroughly and enough of cervical tissue cut away, so that these glands are mostly removed at the same time. In extremely obstinate cases a circular amputation of the cervix will effect a permanent cure.

Ophthalmic Record, Chicago

July, XXIII, No. 7, pp. 325-378

- 101 Conservation of Vision. F. Allport, Chicago.
- 102 Related Figurative Chiasmal and Mean Cyclopean Images. C. F. Prentice, New York.
- 103 Lagrange Sclerectomy and Elliot Trephe Operation. J. Meller, Vienna.
- 104 Treatment of Sympathetic Ophthalmia with Atophan or Nov-atophan. H. Gifford, Omaha.
- 105 Conjunctival Hemorrhage in Typhoid. Z. C. Layson, Hinton, W. Va.
- 106 Practical Value of Routine Bacteriologic Examinations of Conjunctiva. W. H. Snyder, Toledo, O.

South Carolina Medical Association Journal, Seneca

July, X, No. 7, pp. 575-604

- 107 Injury of Vena Cava During Nephrectomy. L. Guerry, Columbia.
- 108 Causes and Prevention of Deafness. J. W. Jervey, Greenville.

Texas State Journal of Medicine, Fort Worth

July, X, No. 3, pp. 109-146

- 109 Medical Life Insurance. J. H. Florence, Houston.
- 110 Treatment of Pellagra. I. Dyer, New Orleans.
- 111 Report of Cases of Pellagra. W. L. Allison, Fort Worth.
- 112 Intestinal Parasites in Texas, Microscopic Findings in Fifteen Thousand Cases. O. H. Judkins, Austin.
- 113 Medical and Surgical Fees. W. B. Thorning, Houston.

110. Treatment of Pellagra.—The general care of the pellagrin is summarized by Dyer as follows: Insist on cheerful surroundings; have the patient adopt the motto "Look up" and adhere to it. Establish a morale from the beginning by an optimistic view of the prognosis. Warn the patient of a long time treatment, of relapses and of the need of proper care and treatment between the attacks. Keep out of the sunlight. Spend the day between sun up and sun down on the shady side of the house, with the light obscured. Also keep out of the kitchen and away from over-heating occupations. Keep the patients out of bed, so long as this is possible. Do not let them go to bed except to rest, or when the symptoms of the disease compel.

When the acute symptoms are controlled, reduce the quinin hydrobromate to 2 grains three times a day and give general tonics, as the glycerophosphates, lactophosphates, iron and manganese compounds. Arsenic is permissible and serviceable. Dyer usually gives the sodium arsenite with other tonics, as:

	gm.	or c.c.	
R. Liquor sodii arsenitis	20		gtt. iii
Tinct. nucis vomicae	1		gtt. xv
Tinct. gentianae comp.	1	or	gtt. xv
Tinct. cinchona comp.	1		gtt. xv
Syr. pruni virginianis	q. s.	ad	3 i

M. et Sig.: In water after meals.

Blaud's compound pills are also useful. The improvement in appetite, strength and desire to take gentle exercise are signs of improvement. No better criterion, however, can be found than the gradual gain in weight. As the loss in weight is a constant factor in the syndromes of pellagra, so the obverse is more than casual in its importance with relation to a return to normal.

The most important period of treatment in most cases of pellagra is during the usual seasons of attack or in the months of cold weather. Every effort should be made to bring the patient up to normal of resistance. The physician should see the patient often enough to maintain a psychologic relation which will permit control. The dietetic care, the medicinal treatment (tonics, regulations of functions, etc.) should be systematic. The weight should be recorded regularly so as to see what normal may be maintained. As the warm season approaches any loss of balance can be noted and met. Often a change of climate for these patients treated already during the first attack will obviate a recurrence.

Washington Medical Annals

July, XIII, No. 4, pp. 233-277

- 114 Kangri-Burn Cancer. A. F. A. King, Washington.
- 115 Three Abdominal Cesarean Sections. W. S. Bowen, Washington.
- 116 Cysts of Liver. D. S. Lamb, Washington.
- 117 Foot-Strain: Anatomic Explanation with Suggestions for Treatment. J. Dunlop, Washington.
- 118 Value of Birth Certificate. L. Eliot, Washington.
- 119 Dr. J. B. Murfree's Case of Lithopedion. D. S. Lamb, Washington.
- 120 Malignant Intra-Ocular Tumors. C. R. Dufour, Washington.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Tuberculosis, London

July, 1911, No. 3, pp. 135-194

- 1 Tuberculosis Movement in Wales. M. Paterson.
- 2 Roentgenography in a Tuberculosis Dispensary. J. A. P. Cullen.
- 3 Disinfection of Tubercle-Infected Houses. A. M. Hewat.
- 4 Tuberculosis in Children. E. Carling.
- 5 Nursing Organization and Administration for Tuberculous Patients in Country Districts. A. W. F. Sayres.
- 6 Aims and Methods of Tuberculosis Nurse. M. Rundle.
- 7 Genius and Tuberculosis. A. C. Jacobson.

British Medical Journal, London

July 18, 1911, No. 2794, pp. 105-160

- 8 *Problems in Cardiac Physiology. A. F. S. Kent.
- 9 *Causation, Prevention, and Cure of Goiter, Endemic and Exophthalmic. R. Farrant.
- 10 Anoci-Association in Prevention of Shock and Postoperative Discomforts. H. B. Butler and E. W. Sheaf.
- 11 *Radical Cure of Inguinal Hernia. J. O'Connor.
- 12 Case of Uremia with an Unusual Degree of Urea Retention. H. B. Day and W. H. Wilson.
- 13 Latent Dysentery, or Dysentery Carriers in Sarawak, Borneo. W. L. Christie.
- 14 Three Cases of Infective Arthritis Treated by Specific Methods. D. W. C. Jones.
- 15 Pneumococcal Arthritis Following Acute Pneumonia. W. S. Richardson.

8. Problems in Cardiac Physiology.—It is shown by Kent that there exist in the heart, in the neighborhood of the auriculoventricular groove on the left side of the organ, neuromuscular structures whose constituents are partly nervous and partly muscular, and these have connections with the nervous structures of the groove and with the muscular tissue of auricle and of ventricle. There exists also in the right lateral wall of the heart a mass of hitherto undescribed nodal tissue. In association with this mass there exists at least one muscular path between auricle and ventricle along which impulses can pass, and which is able to keep the chambers in physiologic association even when the auriculoventricular bundle has been cut. Experimental results have been obtained by Kent which completely bear out the anatomic fact of the existence of an additional muscular path between auricle and ventricle.

In the exposed heart of the mammal the bundle has been cut and electrocardiograms have been taken subsequently. These showed that the rhythm between auricle and ventricle persisted. In the beating heart of the mammal a thin knife was passed through the right ventricle, near the groove, and brought out in such a way as to sever completely the auricles from the ventricles with the exception of a strip of tissue at the right side of the heart. Under these conditions it was found that beats arising spontaneously in the right auricle pass through to the ventricle, and evoke ventricular beats, and, after the heart has ceased to beat spontaneously, beats excited artificially in the auricle still pass through to the ventricle and give rise to ventricular beats.

Since under these conditions the only tissue connecting the auricle to the ventricle is the strip at the right side of the heart, and the histologic part of the inquiry has already shown that an anatomic connection exists in this situation, it is impossible to avoid the conclusion that in this right lateral auriculoventricular junction there exists a muscular path capable of transmitting impulses and of coordinating the action of the chambers of the heart. Further, since, as has been shown, the muscular path is completed by the interposition of a mass of nodal tissue, through which the impulses must pass, it is clear that the conditions here are similar to those found in the case of the auriculoventricular bundle, and that the auriculoventricular pause may be explained on similar lines—that is, as being due to the passage of the impulse over tissue modified histologically and physiologically, with a resulting delay in conduction.

9. Endemic and Exophthalmic Goiter.—The object of Farrant's paper is to record observations made on eighty-five cases of goiter (exclusive of simple hyperthyroidism) between

1909 and 1914 as to the relationship between toxemias and diseases of the thyroid; to prove that in cases in which the thyroid is diseased the causatory micro-organism or toxemia can be determined; to show that in this way not only can diseases of the thyroid be cured, but also prevented. Endemic goiter, according to Farrant, is caused by the toxins from the atypical forms of *B. coli*. The mutants are usually conveyed by water. They become indigenous in the intestine, and different mutants of *B. coli* are to be found in the feces of cases of endemic goiter. The mutants are but rarely present in the feces of normal individuals or in the feces of individuals goiterous from other causes. It is possible to conceive circumstances which place the *B. coli* under abnormal conditions in the intestine itself, and lead to mutation and the temporary appearance of mutants in the feces of normal individuals. The mutants set up an apyrexial toxemia, which stimulates the thyroid, so leading to a colloid hyperplasia and eventually to enlargement of the gland. The whole process can be imitated in the laboratory, and endemic goiter induced in guinea-pigs by feeding with small doses of the mutants.

The supervention of a fresh toxemia while the gland is in a hyperactive state causes a complete hyperplasia, with absorption of colloid and signs of hyperthyroidism up to a condition of exophthalmic goiter. This is dependent on the intensity and duration of the fresh toxemia. Endemic goiter is preventable by the avoidance of water contamination and by the sterilization of contaminated water. It can be cured by the administration of intestinal antiseptics, the gland returns to normal, providing no degeneration has taken place. The gland as a whole involutes to normal, but the adenomata or cysts are left. A condition similar to endemic goiter can be caused by other toxemias capable of inducing a colloid hyperplasia.

Exophthalmic goiter, Farrant claims, is due to a combination of toxemias of an intensity sufficient to cause a hyperplasia with absorption of the colloid material. One acts during a period sufficient to give rise to a complete hyperplasia associated perhaps with slightly marked signs of hyperthyroidism without necessarily any glandular enlargement. The supervention of another infection stimulates the gland, which usually enlarges, and the signs of hyperthyroidism become very evident; the case develops into one of typical exophthalmic goiter. A nervous shock may lead to the diagnosis by suddenly bringing into evidence the symptoms of hyperthyroidism, especially those connected with the nervous system.

The severity and duration of exophthalmic goiter is dependent on the intensity and duration of the toxemias. If they be of short duration the disease will disappear in a few months. Exophthalmic goiter can be prevented by the detection of the early cases of hyperthyroidism and the consequent removal of the basal toxemia. Exophthalmic goiter can be cured if the causatory agents be removed before degeneration has occurred either in the gland or in those organs that are affected by the hypersecretion.

When degeneration has taken place in the thyroid removal of the toxemias causes involution to take place only in the hypertrophied portion; the adenomata and cysts are left. These require appropriate surgical treatment, as they to a certain extent keep up the symptoms of thyroid excess. Surgical treatment without removal of the cause is followed by recurrence unless so much of the gland substance has been removed that hypersecretion is impossible. Degeneration in the other organs partially recovers after involution of the thyroid; appropriate treatment is necessary for those that remain. Acute cases of exophthalmic goiter may present themselves in which surgical treatment is the only means of saving them, though the risk of death under the anesthetic perhaps precludes operation.

11. Radical Cure of Inguinal Hernia.—O'Connor employs a long incision, extending from the level of the pubic spine to a point about one inch below and internal to the anterior superior iliac spine. The superficial epigastric and superior external pubic vessels are seized with forceps, divided between

and ligated, and the aponeurosis of the external oblique thoroughly exposed. The intercolumnar fibers of the external ring are then snipped with scissors and with the handle of the scalpel the aponeurosis is split, parallel to its fibers, to the upper limit of the incision. The divided aponeurotic "leaves" are next seized on each side by pressure forceps, which act as tractors, and considerably facilitate the thorough separation of the former, by blunt dissector, from the underlying structures. Free and isolate the cord, and separate, incise and remove the hernial sac, and suture the opening flush with the peritoneal cavity. This completed, the cord is raised up and placed well out of range of injury behind the two tractor forceps attached to the edge of the internal leaf of the divided aponeurosis. The external leaf is drawn firmly downward and outward until the inner shelf of Poupart's ligament comes well into view.

Taking this exposed shelf as level, a curved hernia needle is passed from without inward right through the reflected aponeurosis—the lower one embracing in transit some fibers of Gimbernat's ligament—passed across the floor of Hesselbach's triangle, and made to emerge through the substance of the conjoint tendon. The needle is now threaded with strong catgut and withdrawn. The unthreaded needle is again similarly introduced about half an inch above the former and a mattress suture completed. Three more similar ones are inserted through the above level and sufficient room is left at the upper angle for the passage of the cord. When these four sutures are tied the inner shelf of Poupart's ligament is firmly approximated to the conjoint tendon. Hesselbach's triangle is completely obliterated. Finally, the two aponeurotic leaves are united by a continuous catgut suture, and in doing this insert the point of the needle deep enough to catch hold of underlying muscle in order that no intermuscular dead space may be left. The cord is left, as in Halsted's operation, superficial to the external oblique.

Journal of Obstetrics and Gynecology of British Empire, London

May, XXV, No. 5, pp. 231-302

- 16 Investigation of Study of Early Human Ovum. R. W. Johnstone.
17 Treatment of Retrodisplacement of Uterus. R. Worrall.

June, No. 6, pp. 303-366

- 18 Working of Midwives Act (England, 1902). F. H. Champneys.
19 "Sustentacular Apparatus of Female Genital Canal. V. Bonney.

19. Displacements of Genital Canal.—Bonney urges that the terms "prolapse of the uterus" and "falling of the womb" are misnomers and should be replaced by others expressive of the nature of the displacement. The uterus not only takes no part in the production of "prolapse," but actually resists the attempt of the vaginal culdesac to turn inside out. Inversion of the uterus and ectropion of the cervix are the uterine homologues of vaginal inversion and eversion. In the treatment of the displacements of the genital canal the nature of the displacement in each individual case should be determined accurately. The indiscriminate application of a particular method of treatment should be abandoned in favor of measures founded on the nature of the displacement in each case.

The absence in the past of a scientific basis to operative treatment has led to much bad surgery. Thus ventrofixation is still performed by some for vaginal eversion—a perfectly useless proceeding—while cases of pure vaginal inversion are still more often thus treated, although the resistance of the intact broad ligaments often makes it impossible to fix the uterus high enough to exercise efficient traction on the vaginal vault. Combined laxity of the middle and lower supporting groups is frequently dealt with by repairing the pelvic floor alone, with the natural result that the patient presently returns complaining that "womb falls again." Mistakes such as these will not occur when it is generally recognized that in the treatment of the results of sustentacular relaxation accurate knowledge of the fault that lies behind the deformity is the first essential for success.

Lancet, London

July 18, II, No. 4742, pp. 141-206

- 20 Prognosis. W. H. White.
21 "Incomplete Rotation of Intestinal Loop as Cause of Retrocolic Hernia. A. G. T. Fisher.
22 "Hemorrhagic Typhoid: Report of Three Cases. A. Caddy and B. Molony.
23 Oral Sepsis in Diagnosis and Treatment of Pulmonary Tuberculosis. R. C. Wingfield.
24 Auricular Flutter Followed by Paroxysmal Auricular Fibrillation. E. B. Gunson.
25 Bacillus of Bovine Tuberculosis as Factor in Phlyctenular Affections of Eye. S. Stephenson.
26 "Case of Femoral Hernia Treated by Bone Transplantation. W. H. C. Greene.
27 Intrapharyngeal Administration of Warmed Ether Vapor by Nasal Route. H. M. Page.
28 "Case of Primary Carcinoma of Liver in Child Three Years Old. W. T. Freeman.
29 English Medicine and Surgery in Fourteenth Century. D. Power.

21. Case of Retrocolic Hernia.—Fisher's case came to notice in the dissecting-room. The subject was a man, aged 57, whose death was due to senile degeneration of the heart. On opening the abdomen a broad apron-like fold was seen stretching across the greater part of the right side of the abdomen. Further examination showed that the fold of peritoneum was the anterior wall of a hernial sac. On the left side it was attached to the "hepatic" flexure of the colon, ascending colon and cecum. Superiorly it was attached to the lower border of the first part of the duodenum and became adherent to the right edge of the great omentum. On the right side it bulged somewhat and became continuous with the peritoneum over the right kidney and iliac fossa. Anteriorly it presented a free edge which was by no means tense, and it was devoid of any vessel. The lower free edge ran in the interspinous plane and was attached laterally to the peritoneum over the right psoas muscle, and internally to the posterior surface of the appendix and meso-appendix. The anterior wall of the sac occupied the lower half of epigastric region in its right two-thirds, right two-thirds of umbilical region, and the right lumbar and hypochondriac regions, and the upper third of the right iliac and hypogastric regions.

The cecum was rotated and kinked, so that the posterior surface looked directly forward and the anterior surface was in contact with and partly hid from view the ascending colon. The appendix occupied the upper left quadrant of the hypogastric region. The transverse colon consisted of two limbs, a descending and an ascending. The descending ran from the hepatic flexure following the left lateral plane as far as the brim of the pelvis; the ascending limb passing upward and outward in the left iliac and lumbar region to splenic flexures. The kink in the transverse colon lay over the brim of the pelvis and was connected to the anterior surface of the cecum. The great omentum had the usual attachments but was pushed over into the left side of the abdomen and ended in a long pointed process. The liver and stomach were normal in their position.

On opening the sac it was seen to extend upward beneath the right lobe of the liver, and it was seen that the condition was due to a developmental abnormality. On the floor of the sac was the root of the mesentery, attached along an oblique line stretching from the junction of the first and second parts of the duodenum downward and to the left to the termination of the ileum. Its length was about 6 inches. Some five feet of small intestine, presenting a perfectly normal appearance, were also found in the sac. The second part of the duodenum, which was also in the floor of the sac, had a continuation of the mesentery attached to its left side, but was adherent behind to the posterior abdominal wall in a fairly normal way. The third part of the duodenum was freely movable, having a common mesentery with small intestine from which it was indistinguishable. It was not crossed by the superior mesenteric artery, neither was there any trace of a duodenojejunal flexure. The whole length of the small intestine was only 9½ feet.

22. Hemorrhagic Typhoid.—In the first of these cases, during the course of the fever, there developed an extensive

purpuric eruption, which was followed by a generalized bleeding from the mucous membranes, viz., the tongue, gums, bladder and intestines. In the second case hematemesis occurred while the fever was at its height. This happened on three occasions, together with bleeding from the bowel. The third case was one of intestinal hemorrhage complicating typhoid and ending in recovery.

26. Femoral Hernia Treated by Bone Transplantation.—Greene's patient, a male, aged 57 years, had a double femoral hernia of about fourteen years' duration. That on the right side was very large and caused great inconvenience; that on the left was smaller, but had recurred a year after an operation previously undertaken. The right-sided swelling was reducible, and the whole hand could be introduced into the ring. The sac was exposed by means of a transverse incision, the contents reduced, and the neck ligatured in the ordinary manner. About 2 inches of the eleventh rib were then excised subperiosteally and the bone was split into two pieces through the cancellous tissue. The femoral wound was then widely retracted and the bone grafts were introduced into pockets made in the periosteum at the back of the pubic bone. There was no trouble in fixing them, and Poupart's ligament was then drawn down to the pectineus fascia, leaving a firm bone plate on its abdominal aspect. The left hernia was dealt with by the ordinary method. The wounds healed soundly and the bone transplant can be felt firmly in position. The shadow of the transplanted bone can be seen in the roentgenogram.

28. Carcinoma of Liver in Child.—The points of interest in Freeman's case were the primary malignant growth of a carcinomatous nature in a child of only 3 years of age, the absence of all secondary deposits, and until the end was quite near the comparative absence of pain, tenderness, or of decided dyspepsia or anorexia.

Archives Générales de Chirurgie, Paris

June, VIII, No. 6, pp. 641-768

- 30 *Cancer of the Testicle. J. Sakaguchi. Commenced in No. 5.
31 *Cancer of Large Intestine in the Young. J. Baur and P. Bertein.
32 Intestinal Pneumatosis. (Kystes gazeux de l'intestin.) P. Maurice.

30. Cancer of the Testicle.—This article is based on study of museum specimens and a few clinical cases—a total of thirty-two cases of cancer of the testicle. In one case the testicle was the seat of both a cancer and a tuberculous process with no direct connection between the lesions. In four cases there was a history of local trauma. As a rule the cancer does not cause pain or enlargement of the testicle and the chance for operating is often lost before the malignant disease is recognized. The ages of the patients ranged from 2 to 60 or more, one man of 26 succumbing to metastases which are common with cancer of the testicle. Most of the patients were between 30 and 50.

31. Cancer of the Large Intestine in the Young.—Baur and Bertein have encountered 2 cases in young soldiers and have compiled 19 other cases in persons under 20. Nine were in the cecum or colon but 12 were at the sigmoid flexure. In 2 cases the patients were under 10; in 11, under 20, and in 7, under 25; all were males except 7 and one monster with a congenital cancer in the colon. In all but 2 cases only seven or eight months elapsed between the first signs of trouble and death; in the others, two and four years. Pain is usually the first symptom to attract attention. It may be localized far from the site of the lesion and it may occur in paroxysms. In one case melena was the first sign of trouble, in 3 cases sudden complete ileus and in another ascites. Three of the patients were cured for the time being in the 5 cases in which the growth was resected.

Archives Générales de Médecine, Paris

May, XCIII, No. 5, pp. 389-480

- 33 Operative Treatment of Deviation of Nasal Septum. (Redressement de la déviation de la cloison des fosses nasales par la résection sous-muqueuse.) M. Ballerín.

Bulletin de l'Académie de Médecine, Paris

June 23, LXXVIII, No. 25, pp. 839-878

- 34 *Relief from Toxic Action by Prostatectomy. (De l'action trophique ou désintoxicante de la prostatectomie.) Bazy.
35 Deep, Painful Angiomas in the Members. E. Kirmisson.
36 Technic for Radiography of the Cranium. (Nouveau dispositif pour immobiliser la tête. Diagnostic des lésions de la selle turcique, des tumeurs cérébrales et des altérations des os du crâne.) C. Infroit.
37 Cirrhosis of the Liver and Tuberculosis. Legry.
June 30, No. 26, pp. 879-912
38 Mechanism of Tanning under Exposure to the Sun. (Recherche des éléments constitutifs de la pigmentation humaine dans le cours de l'héliothérapie.) Vidal.
39 *Pellagra. L. Sambon.
40 Spontaneous Healing of Bilateral Renal Processes. J. Castaigne.

34. Toxic Action of Enlarged Prostate.—Bazy protests against calling the removal of the enlarged prostate a "prostatectomy" as the prostate itself is not removed but only the proliferating glandular tissue, the adenoma, obstructing the passage. The operation should be called rather "prostatic adenectomy." The prostatic tumors seem to have a directly toxic action in addition to the mechanical obstruction. He reports two typical cases in which the general health showed remarkable and permanent improvement after the operation although there had been no retention of urine previously, as the bladder had been constantly drained and sterilized. He has been very successful with his operations on the prostate, and ascribes this to his practice of tamponing the cavity after removal of the exuberant gland tissue, packing the tampon around a large retention catheter. A large tube in the bladder wound permits continuous irrigation with saline, a drop at a time, the fluid escaping through the catheter. The tube is removed the fourth day and the bladder sutured.

39. Pellagra.—Sambon traces the history of pellagra from a description of the disease by Pliny down to the present and shows that it prevailed in those early days in Spain, Italy, France, etc., the foci known then being still in the pellagra zones. He quotes Osler's statement in 1906 that pellagra does not exist in the United States and Babcock's discovery of it in 1906; in 1912 it had been encountered in thirty-two states and 30,000 cases had been recorded. The disease was not known in Great Britain until Sambon in 1912 started out to look for it, and in a few weeks found over 20 cases and now knows of 100, showing that it is endemic in England, Scotland, Ireland, Wales and the Shetland Islands. The disease there is typical pellagra, exactly like the pellagra he has studied so closely in Italy and elsewhere. Pellagra, like malaria, has certain defined zones, and they do not include cities. All the evidence is against direct contagion; not an instance is known of transmission of the disease to others. He adds that he took a pellagrin girl from Italy to England five years ago and she has served as cook in his family since, and has been cured for about two years. Persons who go to reside in a pellagra focus inevitably contract the disease and usually in the first year, while others who work in the pellagra zone in the winter but leave it in the spring escape the disease. Another analogy with malaria is that in the pellagra zones the children are affected; infants escape it until they are old enough to be taken into the fields. He has encountered it in a 3-months babe; one family of five all developed pellagra fifteen days after moving into a pellagra focus. He has encountered cases recently in various parts of France. Sambon incriminates two species of gnats as the transmitters of pellagra, the *Simulium* and the *Ceratopogoninus*.

Lyon Chirurgica

July, XII, No. 1, pp. 1-100

- 41 *Colectomy for Cancer: Twelve Cases. C. Viannay.
42 *Exclusion of the Pylorus by Suture for Gastroduodenal Ulcer. P. Frangopoulos.
43 Hernia of the Bladder: Three Cases. (Hernie de la vessie.) A. Glückstahl.

41. Colectomy for Cancer.—Viannay believes that colectomy completed in one stage is the operation of choice for cancer

if the patient's condition permits it. Of course there are cases in which the two-stage operation is to be preferred—if the patient's general condition is very poor or the colon is firmly fixed by adhesions. In all other cases he opens the abdomen, removes the tumor with free excision of surrounding tissues, sutures the bowel at once and closes the abdomen without drainage. He reports in detail twelve cases on which he has operated for cancer of the intestine. In five of them he performed the one-stage operation without a death; in the other seven the two-stage operation was executed, with three deaths.

42. Exclusion of the Pylorus by Suture.—Frangopoulos discusses the numerous methods of excluding the pylorus and suggests one of his own by simple suture which he has used successfully in two cases. After the usual aseptic technic he irrigates the stomach with a solution of naphthol in water, makes an opening in the lesser and greater omenta, passes an angiotribe through the opening and crushes the pylorus. He then passes a gauze compress through to the opening, passes his index finger over that back of the pylorus and inserts the sutures with a fine curved needle. The insertion of the sutures takes only two or three minutes. The omentum is then sutured over the pylorus. There was no rise of temperature or other sign of infection in either of his cases. The method has the advantage of extreme simplicity and rapidity of execution.

Lyon Médical

July 12, XLVII, No. 28, pp. 57-96

44 *Bean in Bronchus. (Corps étrangers des bronches.) J. Sallès.

44. Foreign Bodies in the Bronchi.—Sallès has found records of 55 cases in which an organic foreign body slipped into the air passages and in 19 cases the foreign body was a bean; in 8 cases a fruit stone; in 10 a pea or coffee bean. The mortality averaged about 50 per cent. and it is probable that an unsuspected foreign body has been the cause of many more fatalities recorded under other headings. In nearly every instance the organic foreign body was "swallowed the wrong way" while the child was laughing hard or coughing, and he insists that parents should be impressively warned of the danger of allowing children to play with dry beans or peas, or laugh when eating them. It is safer to mash beans when served to small children. When the organic foreign body is hard, it should be got out without a moment's delay, but temporizing may be justified with a bean or pea cooked soft as long as there are no signs of bronchitis. Metal foreign bodies are tolerated better than the organic, as a rule, and roentgenoscopy locates them, which is not possible with a bean or similar organic foreign body. Turning the child upside down has little hope of success and he protests vigorously against this dangerous measure unless the foreign body is small, hard and smooth, like a glass bead. With the aid of prompt bronchoscopy the mortality has declined from 50 to 13 per cent. (1909) and Killian reported in 1913 a mortality of only 8.7 per cent.

Presse Médicale, Paris

XXII, Nos. 55-56, pp. 525-544

- 45 Phenomena of Anaphylaxis as Factor in Asthma. (Asthme: La crise hémoclasique initiale.) F. Vidal, Lermoyez, P. Abram, Brissaud and E. Joltrain.
46 Diagnosis and Treatment of Simple Anemia in Young Children. M. Maillet.
47 Technic for Exteriorization in Colectomy for Cancer. P. Cruet.

Archiv für Kinderheilkunde, Stuttgart

LXIII, Nos. 3-4, pp. 161-320. Last indexed August 1, p. 434

- 48 *Lactation in Wet-Nurses. C. Brodsky.
49 *Multiple Sclerosis in Boy of 12. C. Stamm.
50 *Acute Nephritis in Infants. F. Frank.

48. Lactation in Wet-Nurses.—Brodsky gives in forty-five tables the various details in regard to milk production in seventeen women nursing several babes at once and having the residuum carefully drawn afterward. One of the women, a primipara of 25, did not seem to have enough milk for

her own child the first three weeks, but she was given four to nurse and later six, and by the fortieth day she yielded 1,465 c.c. milk and by the seventieth over 4,000 and kept this up for 230 days, once reaching 5,400. By the end of the year she was still giving 2,050 c.c. He thinks her daily average, 3,520 c.c. for 339 days, has established a new record, at least for Switzerland. The yield of milk increases when several babies take the breast and it increases still more when the gland is pumped practically dry afterward.

49. Multiple Sclerosis in Boy of 12.—Stamm says that the negative Wassermann, the changes in the fundus, and the improvement under bed rest and eight intragluteal injections of a preparation of thiosinamin all testify that the presumptive diagnosis of multiple sclerosis was correct. None of the symptoms has returned during the eight months to date; speech and gait are normal and the child seems healthy except for a certain sluggishness in the pupil reaction and slightly exaggerated knee and Achilles reflexes.

50. Acute Nephritis in Infants.—Frank gives the details of 22 fatal cases and comments on the frequency of the hemorrhagic tendency, which was marked in 9. In 12 cases the trouble seemed to be of blood-borne origin; in 7 it was an ascending pyelonephritis. Some focus of infection elsewhere was evident in every case; several foci in some. In 30 cases of otitis media in infants there was also nephritis in 5; regressive changes in the kidney in 10, and in 4 there were hemorrhages plus inflammation in the bladder. Frank emphasizes the significance of the frequent participation of the urinary passages in gastro-intestinal disease in infants, something of the kind being evident in the great majority of his cases.

Beiträge zur Klinik der Tuberkulose, Würzburg

XXXI, No. 3, pp. 457-648. Last indexed July 25, p. 358

- 51 Brehmer's Views and Methods of Treating Chronic Pulmonary Tuberculosis in Light of Modern Progress. F. Wehmer and Wolff.
52 Spinach as Both Food and Medicine. (Die Spinat als Ernährungsmittel.) E. R. Kobert.
53 Disappointing Results with Calmette's Tuberculin. F. Köhler.
54 Lizard Tubercle Bacilli in Treatment of Tuberculosis. (Die Blind-schleichen-tuberkulose—Kaltblütertuberkulose—als Heil- und Immunisierungsmittel bei Lungentuberkulose.) Moeller.
55 Ways and Means Now Known to Prevent and Cure Tuberculosis if the World Will Only Apply Them. Blümel.
56 *Technic for Induced Pneumothorax. C. Saugman.
57 Favorable Results with "Old" Tuberculin. (150 Tuberkulinfälle.) Busch.

56. Induced Pneumothorax.—Saugman devotes nearly a hundred pages to this practical study of artificial pneumothorax as he has applied it in the course of seven years to more than 200 patients. He gives an illustrated description of the technic and insists on the necessity for keeping the patient in bed until the pneumothorax has been effectually induced, or at least until there is no longer any temperature. Until the lung is adequately compressed by the induced pneumothorax the patient should stay in the sanatorium or hospital; only under exceptional circumstances should the pneumothorax be undertaken in a private residence. The main reason for this is on account of danger from the extra work thrown on the other lung. Saugman says that during the six months' period of "active" pneumothorax treatment the patient should be in a sanatorium equipped for this treatment, and in case of complications a one or two years' stay is advisable. This is his practice at the Vejlfjord Sanatorium in his charge in Denmark. He does not consent to the patient's leaving before this unless he feels quite well, when all the manifestations of the active lung disease have long disappeared and their place been taken by the signs of an extensive pneumothorax—the "clinical cure" of the Italians—and the patient can live under favorable conditions at home, and the injections do not have to be made oftener than three or four weeks.

When all these conditions are realized he consents to the patient leaving and gradually taking up some light occupation. Many of his patients were able to return to their business in six or twelve months and soon felt fully capable.

Of course they lived strictly hygienic lives and under constant medical supervision. The "active" treatment stage once past, all that is necessary afterward is to maintain the pneumothorax. This is the special aim of the International Pneumothorax Association, so that wherever the patient may happen to be at the time he can get his injection by a uniform technic when the gas needs replenishing. Saugman urges practitioners in general to take a course in this technic so that they will be able to make the injection properly when a patient applies to them for the purpose if there is no trained specialist available. Among the points to be borne in mind is that a change from one altitude to another modifies the pressure so that the gas may have to be replenished at once. When it is not replenished at the proper time it may prove impossible to induce an effectual pneumothorax again.

Berliner klinische Wochenschrift

July 13, LI, No. 28, pp. 1301-1348

- 58 *Atypical Gout. (Atypische Gicht und verwandte Stoffwechselstörungen.) Goldscheider. Concluded in No. 29. (Blutuntersuchungen bei atypischer Gicht.) E. Steinitz.
- 59 The Thymus and Rachitis. C. Hart.
- 60 The Wassermann Loses in Specificity as It Becomes More Distinct. (Verschärfung der Wassermann'schen Reaktion.) F. Blumenthal.
- 61 Improved Technic for Serodiagnosis. (Einige technische Neuerungen in der Dialysiermethode und die Anwendung derselben in der Psychiatrie.) Schroeder.
- 62 *Direct Roentgenography of Sphenoidal Sinus. (Röntgenbild der Keilbeinhöhle vom Epipharynx aus.) Freystadt.
- 63 Primary Syphilitic Lesion from Practice of Holding Pencil between the Lips. O. Heinemann.

58. Atypical Gout.—Goldscheider calls gout atypical when there are no attacks of pain but the blood and urate deposits, etc., are fully typical of true gout. In the last two years he has encountered 271 cases of tophi without the gouty attacks. The tophi were in front of the knee in 159, in the shoulder in 122, and in the sacrum or ear in 22 cases each. He mentions only 11 cases of tophi in the fingers. A gritting noise in one or more joints was evident in 112 cases, with or without tophi, and in some of the cases tophi developed later in the joints involved. In his experience with true paroxysmal gout this gritting in the joint was evident in 21.9 per cent. of the men and 58.3 per cent. of the women. In the cases free from tophi, it occurred in 5.4 per cent. of the men and 33.3 per cent. of the women. It was most prevalent among those who took least exercise.

62. Roentgenography of Sphenoidal Sinus from Within.—Freystadt introduces directly into the epipharynx the film on a flat flame.

Correspondenz-Blatt für Schweizer Aerzte, Basel

July 11, XLIV, No. 28, pp. 865-896

- 64 *Combination Treatment of Varices of the Legs. H. Matti.
- 65 Pharmaceutical Advertising Matter on Card-Catalogue System. (Vereinheitlichung der Arzneimittel-Reklame.) M. Roch.

64. Combination Treatment of Varices.—Matti resects the varicose veins a little at a time, and induces thrombosis in the stretches between by injecting phenol. By proceeding slowly and gradually in this way, he avoids extensive resection of the saphenous vein. The patches of extremely dilated veins are resected but the rest are spared and they merely shrivel and become plugged by the reaction to the injected phenol. Seven cases are reported in which this comparatively mild but extremely effectual combination treatment was applied.

Deutsche medizinische Wochenschrift, Berlin

July 16, XL, No. 29, pp. 1457-1504

- 66 *Treatment of Threatening Conditions in Pleurisy. J. Grober.
- 67 *Symptoms from Impairment of Functioning in Central Nervous System. (Ausfallerscheinungen nach Affektionen des Zentralnervensystems und ihre Rückbildung.) M. Rothmann.
- 68 Phenomena from Adsorption in the Abderhalden Reaction. A. Peiper.
- 69 Chemotherapy of Experimental Cancer. F. Pentimalli.
- 70 Criticism of Phenolphthalein Test for Occult Blood. II. Schirokauer and I. Boas.
- 71 Relations between Flat-Foot and Tuberculosis of the Foot. Syring.

- 72 Preparation of Blood Platelets Arrests Hemorrhage. (Fermentative Blutstillung durch Coagulen.) G. Hotz.
- 73 Emphysema Following Stenosis of the Trachea with Goiter. (Erneute Atemnot nach gelungenen Kropfoperationen.) Dobbertin.
- 74 Copper and Mercury Lamp in Treatment of Ulcus Rodens; Two Cases. H. Weiss and A. Strauss.
- 75 Does Semen Containing Spirochetes Infect Mother or Ovum First? (Gibt es eine paterne Vererbung der Syphilis.) F. Lesser.
- 76 Trademarks and Protected Names for Proprietarys. (Wortzeichenschutz für Arzneimittel.) E. Kobner.

66. Treatment of Threatening Conditions in Pleurisy.—Grober says that when conditions demand relief from the effusion at once, we can generally assume that the lung is not adherent to the pleura and can thus venture to use a simple puncture needle instead of a trocar. To regulate the pressure and thus avoid doing harm by abrupt changes of pressure, he runs the needle into a fish bladder, when a suitable apparatus is not at hand. The fish bladder gives to the pressure and does not permit air to be sucked into the needle. The same purpose is accomplished by a tube on the end of the needle, the other end submerged in a vessel with salt solution. By raising and lowering the vessel the pressure in the needle can be regulated and the tube clamped with a clothes-pin.

He advises withdrawal of the effusion even when it is of moderate amount if there is fever, indicating a septic course, or if the effusion is bilateral. When there is fever it seems wise to rinse out the pleural cavity thoroughly with some mild disinfectant even if the effusion is apparently limpid. He declares that every practitioner should familiarize himself with the correct technic for thus flushing the pleural cavity through two minute openings or more extensive openings to clean up an empyema. If the effusion is tinged with blood, too much of the fluid should not be evacuated at a time or the hemorrhage may recur. With cancer, the effusion always rapidly collected again in his cases. Mishaps do not occur so often after puncture now as formerly, as we do not wait until it is the last resource. After each puncture the patient must recline for a time and a camphor injection may be useful. Even with all precautions we are still unable to ward off positively danger of embolism of the pulmonary artery.

Pain is best combated by cupping; the blood thus drawn relieves the congestion and pressure below, but he has never witnessed any benefit from strapping the chest with plaster. An important indirect means of influencing the effusion is to apply all possible measures to aid in the throwing off of fluids; calomel aids usefully in this, both by way of the bowels and the kidneys (0.3 gm. three times a day at most). He has always found that this had a very powerful diuretic action; by the second or third day, up to 8 or 10 liters of urine may be voided. Of course the calomel can not be used in this way unless the kidneys are sound; any tendency to nephritis would be much aggravated by it. Another effectual means of throwing off fluids, he adds, is to chew chewing gum vigorously, spitting out all the saliva, keeping this up all day long. He says of sodium salicylate as a diuretic, that its injurious action on the sound kidneys is only transient and should not deter from its use in appropriate cases.

67. Retrogression of Symptoms after Removal of Growths Causing Compression in the Central Nervous System.—Rothmann's extensive report of experiments on animals concludes with a most encouraging view as to the remarkable effects that may be realized by systematic, persevering exercise to restore function. Restitution of functioning is materially promoted and hastened by appropriate exercises. Even dogs paralyzed from removal of the brain, soon learned to follow the moving chair with their hind legs when their front legs were placed on the chair. The phylogenetic older functions were lost last under the affection in the central nervous system, and these were regained first. This point should be borne in mind in starting and carrying on the course of exercises. His research fails to sustain von Monakow's conception of diaschisis.

Medizinische Klinik, Berlin

July 19, X, No. 29, pp. 1213-1254 and Supplement

- 77 Chronic Catarrhal Gastritis. (Magenkatarrh.) W. Wolff.
- 78 Unusual Types of Tetany; Two Cases. K. Grahe.
- 79 Combination Orthopedic Treatment of Curvature of the Spine. (Abbott oder Calot?) E. Mayer.
- 80 Influencing of the Functioning of the Heart by Various Forms of Baths. Grosch.
- 81 Honey and Its Adulterants. (Wissenswertes über Honig.) J. Fiehe.
- 82 Hysteria and Trauma. Placzek. Commenced in No. 28.
- 83 Present Status of Treatment of Blood-Diseases. II. (Blutkrankheiten.) F. Port.

Mitteilungen a. d. Grenzgeb. der Med. und Chir., Jena

XVIII, No. 1, pp. 1-212. Last indexed June 13, p. 1934

- 84 "Pulsions Diverticulum" in the Esophagus. S. Maruyama.
- 85 *Gastric Crises and Vagotomy. A. Exner and E. Schwarzmunn.
- 86 *Tuberculous Stenosis of the Pylorus. W. Pfanner.
- 87 *Operative Treatment of Exophthalmic Goiter. D. Glaserfeld.
- 88 *Operative Treatment of Bronchiectasia. A. Wydler.
- 89 *Gastric Ulcers Remote from the Pylorus. Faulhaber and E. von Redwitz.

85. Gastric Crises and Vagotomy.—Exner and Schwarzmunn report experiences which show that the vagus forms part of the reflex arcs which are involved in the production of the gastric crises in tabes, and that by severing the vagus nerve the reflex arcs are broken up and hence there can be no more of the gastric crises. They have operated in 14 cases on this assumption and 7 of the patients were freed completely from the gastric crises, 2 others materially improved, and no benefit was apparent in 2. None seemed to be injured by the operation; the crises were not aggravated in any instance. In the others the operation is of quite recent date. Four other surgeons have done vagotomy for gastric crises in a total of 6 cases, curing 3 of the patients; no benefit in 1, and aggravation of the crises in 1. This is a total of 50 per cent. cured; 10 per cent. improved, and 15 per cent. quite recent operations. Resection of the posterior dorsal roots, as applied by Foerster and three others, now has a record of 45 or 48 per cent. cured of 145 patients, with from 11 to 23 per cent. mortality. The vagotomy is comparatively simple; 1 cm. is resected from the vagus on each side. The difference in the outcome may depend on the anatomic conditions encountered; in 9 of their 14 patients the vagus was still a trunk nerve under the diaphragm; in 3 others it branched before piercing the diaphragm, and in one case only some of the branches were accessible. The details and outcome are tabulated for each case.

86. Tuberculous Stenosis of the Pylorus.—Pfanner reports a case of this kind in a young man successfully operated on. He had a chronic apical affection and severe stenosis at the pylorus developed suddenly, without premonitory symptoms, suggesting a gastric ulcer. The tuberculous process was in the upper duodenum and involved the pylorus and this entire stretch was resected. The apical process subsided also and the young man seems now, six months later, to be on the road to perfect health.

87. Operative Treatment of Exophthalmic Goiter.—Glaserfeld has compiled from the literature 2,032 operations on the thyroid, with a mortality of 5.4 per cent., but the percentage is growing constantly less with better technic and better appreciation of the contra-indications. In 534 cases in which the operation was done for exophthalmic goiter, 349 of the patients regard themselves as cured (65.36 per cent.) and 88 (16.48 per cent.) very much, and 41 considerably improved. The operation was a failure in only 31 and there has been recurrence in 25. In later series the cured and improved reach 73 to 90 per cent. The tachycardia and tremor subsided after the operation in 80 per cent.; the psychoses in nearly all cases; the diarrhea and amenorrhea in all, while the protruding eyeballs subsided into normal place in 53.7 per cent. of all the cases. The only means to estimate the actual value of operative treatment, he reiterates, is to have internists and neurologists make systematic after-examinations from a uniform standpoint, such as is outlined in a question-blank which is given in full. He sent it to fifty leading internists and neurologists in Germany and Austria, and fourteen were returned filled out, but evidently there has

been no systematic study of the ultimate condition in these operative cases. Glaserfeld was unable to find any evidence that these patients operated on for exophthalmic goiter were rendered any more susceptible to other diseases thereafter.

All agree that operative treatment should not be considered until medical treatment has been given a thorough trial and shown that it is inadequate to cope with the disease. The slightest sign that any one of the symptoms is growing worse during medical treatment may be accepted as a call for an operation even in the mild cases. This requires that Basedow patients must be under constant medical supervision; when this is the case there is little chance that the best time for the operation will pass unobserved.

88. Operative Treatment of Bronchiectasia.—Wydler's experience in the case reported shows that it is better to proceed at once to resect the lobe of the lung involved without wasting time on resection of ribs and ligation of the pulmonary branches. Little if any benefit was realized from four operations on the ribs but after resection of the lobe of the lung almost a complete cure followed. The patient was a young man with bilateral congenital bronchiectasia; the sputum was so offensive that he was unable to hold any job. As the bronchiectasia affects the opposite lobe to some extent, the cure was not absolutely complete.

89. Gastric Ulcer at a Distance from the Pylorus.—This study of 52 cases treated by gastro-enterostomy or resection shows that the ultimate outcome is far better with radical, circular resection. When there is extreme hyperacidity it might be wiser to remove even more than this of the stomach mucosa; the Billroth II might be better in this case. Mere gastro-enterostomy is liable to be followed by various complications. Danger of malignant degeneration is not so imminent as generally supposed; there have been no signs of cancer in the seventeen cases of "callous" ulcer operated on from two to five and a half years ago. The long duration and the periodicity of the gastric disturbances are special features of these cases of "pylorus-remote" tumors, and roentgenoscopy clinches the diagnosis.

Münchener medizinische Wochenschrift, Berlin

July 14, LXI, No. 28, pp. 1545-1600

- 90 Connection between Lymphogranulomatosis and Tuberculosis. P. Baumgarten.
- 91 Filtrable Virus Responsible for Coughs and Colds. W. Kruse.
- 92 *Parasitic Twin Monster. (Epigastrius parasiticus.) F. Marchand.
- 93 Pasteur Treatment and Epilepsy. (Einfluss der Schutzimpfungen gegen Lyssa auf den Verlauf der Anfälle bei Epilepsie.) M. Nikitin.
- 94 Serodiagnosis by Eliminating the Unspecific and Leaving the Specific Protective Ferments. A. v. Domarus and W. Barsieck.
- 95 Magnesium Treatment of Tetanus. K. Stromeyer.
- 96 *Excrecences in Gonorrhea. (Gonorrhoeische Granulationen.) G. Stimpke.
- 97 *Diagnosis of Brain Tumors. (Hirntumordiagnosen.) v. Malaisé.
- 98 *Deforming Arthritis. (Die deformierende Gelenkentzündung im Lichte neuerer Forschungen.) L. v. Stubenrauch. Commenced in 27.

92. Parasitic Epigastric Monster.—Marchand gives an illustrated description of a young man who has a twin monstrosity growing from his stomach region. Born in 1884 of Italian parents at Buenos Aires, J. J. Libbera is now a young man of average weight and size, apparently normal except for the headless male twin growing from his stomach region, about the size of a child of 3. The mother bore another pair of united twins among her thirteen children and one uncle was badly deformed.

96. Excrecences of Gonorrheal Origin.—Klingmüller describes six cases in which there was proliferation of tissue on the perineum or anus in women with a gonorrheal process in the urethra, cervix or rectum. In one case there were also condylomas. The excrecences were something like a cock's comb and some were painful but none bled. They were excised in most of the cases.

97. Diagnosis of Brain Tumor.—A bright, active and ambitious boy of 11 in a few weeks became lazy and slovenly, and began to steal money and bury it. Nine months after this change in character had been noticed, other symptoms of a brain tumor developed and a sarcoma was found in the left

cerebellum. The accompanying hydrocephalus had modified the corpus callosum to such an extent that pronounced left apraxia resulted, diverting attention away from the true seat of the lesion, particularly as the tumor was of such soft tissue that for a long time it caused no symptoms of pressure. In a second case the symptoms pointed unmistakably to a cerebellar tumor. Except for the changes in the gait, they all came on with a stormy onset, with fever, two weeks before the attempt at operative treatment. The sarcoma was not reached and the girl of 15 died the next day.

98. **Deforming Arthritis.**—Stubenrauch emphasizes that the light cast on deforming arthritis by recent research calls for treatment based on static, mechanical and functional principles, as he describes in detail. A history of joint trouble should be borne in mind in selecting a trade or business; in continuing at work, unless the joint can be spared, the process is liable to keep on a progressive course. Early recognition of the joint process is thus indispensable to ward off serious mischief and deformity, and modern methods of diagnosis render this possible, especially when the pain and other subjective and objective findings are correlated with the weight-bearing task and the roentgenograms. Gentle exercise of the joint wards off ankylosis and should be supplemented by every possible measure to stimulate return of normal conditions in the various tissues of the joint. The process with deforming arthritis starts in the joint cartilage, not in the bones, and it is these changes in the cartilage which impair its elasticity and throw the joint out of gear, entailing the deformity. Recent microscopic study by G. Pommer of Innsbruck has confirmed the combination of functional and anatomic factors in the production of deforming arthritis.

Wiener klinische Wochenschrift, Vienna

July 16, XXVII, No. 29, pp. 1053-1092

- 99 Spirochete Findings in Rabbits. L. Arzt and W. Kerl.
- 100 Alimentary Galactosuria in Exophthalmic Goiter. P. Szel.
- 101 Abortive Treatment of Syphilis. J. Saphier.
- 102 Diagnosis of Postoperative Intestinal Ulcer. (Zur Diagnostik des postoperativen jejunalen und Anastomosenukulus.) T. Barsony.
- 103 Comparison of Results with Human and Animal Organs in Serodiagnosis. (Vergleiche zwischen den Resultaten des Abderhaldenschen Dialysierverfahrens mit Tier- und Menschenlunge.) O. Melikjanz.

Zentralblatt für Chirurgie, Leipzig

July 18, XLI, No. 29, pp. 1209-1248

- 104 *Thread and Wire Extension from Skin. (Besondere Formen der Extension.) R. Klapp.
- 105 Forcible Correction of Club-Foot in Children over Padded Segment of Broom-Stick. (Billiges Hilfsmittel zur Redression kindlicher Klumpfüsse.) A. Nussbaum.

104. **Thread and Wire Extension from Skin.**—Klapp applies extension in severe cases of ischemic paralysis of the arm after fracture by a set of double silk threads each passed through the pulp of a finger and all drawn and tied together a foot beyond the tips of the fingers. A 5-pound weight is then suspended for twelve or fourteen days from the knot thus formed. The skin never tears out, the fracture heals and contracture is warded off in both arm and hand. He often has found this technic extremely useful after operations on the hand and arm. A thread can be passed in the same way through the skin of the heel; he found this of great advantage in a recent case after operating on a babe for congenital deformity of the leg. For adults he prefers a wire passed slanting through the heel on each side, the ends drawn out at the bottom of the heel. He applied this technic in eleven cases during the Balkan campaign and found it as effectual as nail extension. The wire or thread must be drawn through the soft parts exactly in the direction in which traction is to be exerted. Otherwise the pressure from the wire cutting into the tissue will cause necrosis.

Zentralblatt für Gynäkologie, Leipzig

July 18, XXXVIII, No. 29, pp. 1017-1048

- 106 *Early Sign of Pregnancy. (Ein häufiges Frühzeichen der Schwangerschaft.) A. Labhardt.
- 107 Abdominal Intrapertitoneal Correction of Retroflexion of the Uterus. W. Rindfleisch.

106. **Early Sign of Pregnancy.**—Labhardt says that the dregs-of-wine discoloration of the mucosa of the vagina characteristic of pregnancy can be detected very early in a transverse strip extending to right and left between the mouth of the urethra and the base of the hymen, closer to the latter than to the urethra. This broad strip of livid tint can be detected usually long before the discoloration is evident elsewhere in the vagina. It is a sign of the venous hyperemia set up by the fact of the pregnancy, and is liable to be encountered with a tumor in the vicinity. But as a rule it is a simple and useful early sign of pregnancy. The discoloration occurs usually most pronounced in women who have already borne children.

Gazzetta degli Ospedali e delle Cliniche, Milan

XXXV, Nos. 83-85, pp. 865-896

- 108 The Russo and Fuchs-Lontz Methylene Blue Reactions in the Urine Not Specific for Any Disease. (Reazioni urologiche al bleu di metilene: Reazione di Russo; Reazione di Fuchs e Lontz.) U. da Pozzo.
- 109 *Arrest of Inflammation by Shutting off Sensory Impulses. (Nuovo contributo clinico alla teoria dell'inibizione infiammatoria per parte di sostanze ad azione anestetica narcotica.) T. Silvestri.
- 110 Nascent Iodin Local Treatment of Uterus. (Airolo ed acqua ossigenata nella medicazione della cavita uterina.) A. Cerioli.

109. **Arrest of Inflammation by Analgesics.**—Silvestri systematically kept four patients with acute cerebrospinal meningitis under the influence of a general anesthetic, hoping thus to allay the local inflammation. The ordinary measures, ice to the head, etc., were applied as usual, but these were supplemented by calcium bromid by the mouth and in enemas, and chloral alternating with morphin. The secret of success is to begin with the analgesics at the very outset of the inflammation and keep it thus under control. He applied the method also in a case of severe polyneuritis with herpes zoster and in several cases of convulsions in young and old. The dosage varied with the case, but he gave the meningitis patients up to 8 or 12 gm. of calcium bromid a day. He found the results very encouraging, confirming the inhibiting action on inflammation of shutting off sensory impulses.

Policlinico, Rome

July 12, XXI, No. 28, pp. 1001-1036

- 111 *Hemoglobinuria in Hookworm Disease. (Patogenesi dell'anemia da parassiti animali.) L. Manzi.
- July, Medical Section, No. 7, pp. 293-340
- 112 Indol and Its Derivatives. O. Cantelli.
- 113 Technic for the Wassermann Test. (L'uso del siero attivo nella sierodiagnosi della sifilide col metodo di Wassermann.) M. Mantovani.

111. **Hemoglobinuria with Hookworm Disease.**—Manzi reports the case of a girl of 14 with a puzzling syndrome of pains and other disturbances in the bladder, dark-colored vomit and urine and extreme pallor but no tube casts. She tired easily and became irritable and melancholy. The discovery that a neighbor had recently returned from a long stay in a hookworm country finally gave the clue to the trouble, and under a course of thymol treatment ova were found in the stools and recovery followed. There did not seem to be intestinal hemorrhage from the mechanical action of the helminths; the blood-corpuscles were evidently being destroyed by the toxin. The eosinophilia and leukocytosis were probably part of the defensive reaction. The temperature kept persistently above normal during the hemoglobinuria stage.

Riforma Medica, Naples

July 11, XXX, No. 28, pp. 757-784

- 114 Nature's Method: Setting Up Compensation (Cardiopatie.) G. Rummo.
- 115 The Evolution of Psychiatry. E. Rossi.
- 116 *Changes in the Blood-Serum after Venesection. (Modificazioni della reazione di siero di sangue dopo il salasso.) C. Rolla. Commenced in No. 27.

116. **The Blood-Serum after Venesection.**—Rolla has found that in normal persons and those with diseases which do not alter the composition of the blood, the blood-serum either does not change after venesection or it grows more alkaline. On the other hand, in diabetes, chronic nephritis and liver disease and in nephrectomized animals and those under the

influence of uranium nitrate, the blood-serum veers toward acidity after venesection. He theorizes to explain this and says that his findings suggest the importance of following up the venesection with subcutaneous injection of an alkaline fluid to render neutral the pathologically acid serum.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam
LXIII, No. 12, pp. 865-936

- 117 *Lupus. A. S. Jacobson.
- 118 Improved Technic for the Differential Leukocyte Count. P. Nicu-wenhuijse.
- 119 Pathogenesis of Human Beings. A. M. Benders.
- 120 Procreation under Influence of Alcohol. (Eugene en alkohol.) W. D. van Renesse.
- 121 Repose Sometimes Aids and Sometimes Hinders Rapid Recovery after an Industrial Accident. D. de Snoo.
No. 13, pp. 937-1024
- 122 Fibrin as a Factor in the Coagulation of the Blood. E. Hekma.
No. 14, pp. 1025-1116
- 123 Radiotherapy of Cancer. G. F. Gaarenstroom.
- 124 Plague in Java. J. G. Sleeswijk, M. J. Planten and J. J. Van Loghem. Commenced in No. 13.
- 125 Isolation in Contagious Diseases. P. de Vries.

117. **Lupus.**—Jacobson found involvement of the mucous membrane in nose, throat or larynx in 80.8 per cent. of 104 cases of lupus of the face. Treatment of lupus therefore should include the mucosa to be permanently effectual.

St. Petersburg medizinsche Zeitschrift

XXXIX, Nos. 12-13, pp. 147-168

- 126 *Suture of Heart; Two Cases. (Herzchirurgie.) H. Fowelin.
- 127 Recurring Typhoid. J. Kusick.
- 128 Tests of Kidney Functioning in Nephritis. M. E. Mirowsky.
- 129 Pathogenesis and Treatment of Cardiovascular Disease. (Herz- und Gefässkrankheiten.) D. Galli.

126. **Suture of the Heart.**—Fowelin reports operative treatment of a revolver injury of the heart with recovery and of a stab-wound in which he was not able to save the patient. The Obuchow Hospital, he adds, has now a record of 28 cases of suture of the heart, with recovery of 8 of the patients; the hospital in Fowelin's charge has done 4 operations of the kind and saved 2; Hochenegg 5, with 3 saved, and von Eiselsberg 7, with 2 saved. Fowelin did not attempt drainage in one of his cases and he attributes the patient's death nine weeks later to complications which might have been avoided by drainage.

Russky Vrach

XIII, Nos. 13-14, pp. 465-524

- 130 *Value of Ambard's Formula in Determination of the Renal Function. B. N. Kholzoff.
- 131 *Postoperative Serous Meningitis. V. M. Minz.
- 132 *Surgical Treatment of Epilepsy. N. I. Korotneff and V. N. Minz.
- 133 *Hydrophobia: Two Instructive Cases. V. G. Oushakoff.
- 134 Prolonged Retention of Placenta after Full Term Extra-Uterine Pregnancy. P. P. Parenago.
- 135 Experimental Cancer. A. V. Chichkin.

130. **Ambard's Formula in Determination of the Renal Function.**—Kholzoff has been giving a thorough trial to Ambard's formula for estimating the work of the kidneys by the proportion between the urea in the blood and in the urine. This "uremic constant" was described in detail in THE JOURNAL, March 7, 1914, page 813. Kholzoff thinks that the total amount of urea and chlorids eliminated by the kidneys during the twenty-four hours is of greater import than the percentage in urine or blood. At the same time he lauds the Ambard index as accurate and reliable, giving a better idea of the renal function than any other method. He says the method is not reliable for determining the function of each kidney separately, because the technic of collecting urine from each kidney is not perfect. Yet it is highly important to collect the whole amount of urine without any losses. Therefore, this method can have only a limited use, as, for instance, for the purpose of determining the function of both kidneys, or when there is but one kidney from congenital deformity or from disease.

131. **Serous Meningitis with Brain Tumors.**—This according to Minz is a frequent occurrence with brain tumors, not only before trephining and removal of the tumor but even after a successful operation. There is liable to be enormous

accumulation of the cerebrospinal fluid, especially with tumors of the posterior cranial fossa or corpora quadrigemina. This causes symptoms of meningism or the symptoms of actual meningitis may occasionally become exacerbated (severe headache, vertigo, vomiting, etc.). Minz recommends puncture of the subarachnoid space, which he has successfully performed in a case of a glioma of the corpora quadrigemina, of a tumor of the middle skull cavity, two cases of successfully removed cerebellar cysts, and in one case of psammoma of the occipital lobe of the brain.

132. **Operative Treatment of Epilepsy.**—According to Korotneff and Minz, surgical treatment of so-called genuine epilepsy is not justified or only when the patient demands same. Temporary improvement may be obtained in some cases. True cortical epilepsy, including the traumatic due to some lesion of a perfectly healthy brain, may occasionally yield to an operation, but a success can not be guaranteed in every case. Trephining is alone justified.

133. **Rabies.**—Oushakoff declares on the basis of two cases of hydrophobia that even insignificant skin lesions caused by a rabid animal may cause hydrophobia, and that a dog bite can be held harmless only when the animal has been kept under observation by a veterinary physician during one week, at least, and found healthy. Otherwise the suspected person must be treated in a Pasteur institute. In the presence of symptoms of hydrophobia, accelerated pulse and general excitement, the surrounding persons must be warned in regard to the possibility of infection, and, if necessary all should be given prophylactic Pasteur treatment which proves as a rule very efficient. The young women were not actually bitten in his two cases. Both died of the rabies; it was not recognized at first. He says that pain at the point of infection may be a clue to an early diagnosis.

Hygiea, Stockholm

LXXVI, No. 12, pp. 589-752

- 136 The Biologic Effect of Exercise in Heart Disease. (Gymnastikens verkningsätt vid hjärtsjukdomar.) E. Zander.
- 137 *Embolie Aneurysm as Complication of Acute Endocarditis. O. Lindbom.

137. **Aneurysm with Acute Endocarditis.**—Lindbom reports a case each of aneurysm in splenic or in iliac artery as a complication of acute endocarditis. His review of the literature on the latter shows that embolic aneurysms are comparatively common with acute endocarditis. They develop mostly in the arteries of the abdomen or limbs and may rupture. The symptoms of internal hemorrhage then dominate the clinical picture or there may be merely sudden violent pain with a pulsating enlargement of the artery. This was the most frequent type in the 18 cases he has found in the literature. Operative removal of the stretch of the vessel involved has given good results in several cases and should be recommended on account of the dangers from rupture. The tendency to embolism persists however and new aneurysms may be formed. Three clinicians have reported cases in which the aneurysm developed in the coronary arteries.

Ugeskrift for Læger, Copenhagen

July 9, LXXVI, No. 28, pp. 1231-1274

- 138 *Roentgenotherapy of Uterine Hemorrhages and Fibromas. H. J. Panner and S. Kjaergaard. Concluded in No. 29.

138. **The Roentgen Ray for Uterine Hemorrhage and Fibromas.**—Panner and Kjaergaard review some of the recent literature on this subject and tabulate their own experiences. They indicate that one can rely on curing uterine hemorrhage with the Roentgen rays when the ovaries are responsible for the hemorrhage. The functioning of the ovaries can be checked by the Roentgen exposures and the myomas themselves generally shrink under them too. The treatment in these cases need not be intensive. Of his ten patients with uterine hemorrhage without a tumor, all but one were cured by the exposures and in the eight fibroma cases the tumor subsided materially in all but one. The great drawback of roentgenotherapy is that under it a cancer might be allowed to slip past the operable-curable stage.

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THE PATHOLOGIC PHYSIOLOGY OF UTERINE BLEEDING *

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The study of uterine bleeding is given a peculiar interest by the fact that the uterus is the only organ in the body from which a periodic hemorrhage occurs as a physiologic phenomenon. The logical point of departure in the investigation of pathologic uterine hemorrhage, therefore, would seem to be a study of the normal type of uterine bleeding, that is, menstruation. Even a superficial familiarity with the enormous literature of the subject, however, will convince one that the problem is rarely approached in this fundamental way. In the study of all the menstrual disorders the tendency has been to lose sight of the fact that there are many links in the menstrual chain, and to emphasize some one factor at the expense of others, which may be equally important. As regards the explanation of uterine bleeding, it is the anatomic point of view which has in recent years received most attention. This is perhaps not surprising when we consider that up to very recent times our knowledge of the menstrual process has been much more highly developed along anatomic than along physiologic lines, and that structural alterations in an organ are far easier to demonstrate than aberrations of function. More and more, however, we are beginning to realize that the uterus is only a keyboard on which many variations are played by a complicated menstrual mechanism whose ramifications extend far beyond the confines of the pelvic cavity. Not only the uterus, but all the other constituent parts of the menstrual apparatus as well are subject to disturbances of one form or another, and hence none of them should be overlooked in the investigation of uterine hemorrhage of obscure causation.

At the outset it may be conceded that in the majority of instances the cause of uterine bleeding is anatomic, in some cases very frankly so. For example, uterine cancer is a perfectly obvious cause of bleeding from the uterus, just as rectal cancer may cause bleeding from the bowel. The same clear relationship is seen in the case of a few other lesions, more especially those of neoplastic type. We may thus distinguish, first of all, a type of uterine hemorrhage clearly due to well-defined and easily demonstrable causes in one part or another of the uterus. There would be hemorrhage from lesions of this type even

though there were no such thing as menstruation to cause a periodic flare-up in the pelvis.

A second group of cases may be distinguished in which a lesion of some sort exists either in the uterus or in the adnexa, but in which hemorrhage would probably not occur were it not for the extra congestion which each menstruation brings with it. A tubal inflammatory mass or an ovarian neoplasm might not in itself be capable of producing hemorrhage, but it frequently exaggerates the menstrual hyperemia, and hemorrhage is the result. When metrorrhagia or intermenstrual bleeding occurs, it would seem at first sight to indicate a direct effect of the lesion itself on the pelvic circulation. This, however, does not necessarily follow, for it is possible, as some have contended, that in many of these cases the disturbance of the menstrual mechanism is much more fundamental, involving the function of the ovary itself.

Finally, there is a third group of cases in which uterine hemorrhage occurs in the entire absence of any clearly demonstrable disease in any of the pelvic organs. I use the expression "clearly demonstrable" advisedly, for numerous efforts have been made to explain the bleeding in these cases along anatomic lines. For many years it was the endometrium which constituted the target for the diagnostic acumen of gynecologic pathologists. The work of Hitschmann and Adler,¹ confirmed by many others,² has done much to clarify our knowledge of the part played by the endometrium in the menstrual process. Except in certain rather exaggerated conditions, such as polypoid endometritis, it is difficult to fix on the endometrium any great measure of responsibility as a cause of uterine bleeding. Many of the supposed abnormalities of the endometrium are perhaps the results rather than the causes of the menstrual disturbances, for we are apt to forget that the hypertrophic changes of the premenstrual period represent the reaction to periodic hyperemia of a very labile tissue—and a tissue made more labile by constant repetition of the process over many years, or, from an evolutionary point of view, over many ages. Abnormalities of the menstrual phenomenon, either in rhythm or in intensity, may thus be reflected in the endometrium, which plays a purely passive part in the process. Furthermore, since the endometrium is always "on edge," it may undergo hypertrophic changes as a reaction to hyperemia other than that associated with menstruation.

In view of our inability to fix the responsibility for uterine bleeding entirely on the endometrium, it is not surprising that the search for a local cause has gone

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Hitschmann and Adler: *Monatsch. f. Geburtsh. u. Gynäk.*, 1908, xxvii, 1.

2. Gardner, W. S., and Novak, Emil: *The Endometrium and Some of Its Variations*, *THE JOURNAL A. M. A.*, Oct. 9, 1909, p. 1155.

deeper into the uterus. It was Scanzoni, in 1861, who first directed attention to the importance of the mesometrium in this connection. Although receiving little attention for many years, the subject has in recent years been again brought to the forefront by the work of Theilhaber³ and others. It is not within my province to discuss the various theories which have been put forth—the “insufficiencia uteri” of Theilhaber, the “metrorrhagia myopathica” of Anspach, etc. There can be little doubt that the myometrium, like the endometrium, is responsible for a certain number of cases of uterine hemorrhage, but the proportion is probably not so large as to throw any great light on the mechanism of uterine hemorrhage in general.

Even less important, to my mind, is the rôle played by disease of the blood-vessels in the production of bleeding from the uterus. Much importance is attributed to this factor by Pankow,⁴ Slocum⁵ and others. There are many objections to such a view, especially to the explanation which many offer that the bleeding is the result of an actual rupture of the blood-vessels—an “apoplexia uteri.” This is not the place to discuss these objections—some will suggest themselves. No satisfactory proof has been advanced that arteriosclerosis or atheroma of the pelvic blood-vessels exerts more than an occasional influence in producing uterine hemorrhage.

It will thus be seen that the occurrence of uterine bleeding is not necessarily associated with anatomic findings in the uterus, which is the immediate source of the menstrual flow, or in the other pelvic organs which participate to a greater or less extent in the menstrual phenomenon. Shall we, in spite of our failure to find an anatomic explanation in many cases of uterine bleeding, still tell ourselves that it *must* be there? Or shall we make our study more comprehensive, remembering that other factors than the organs themselves are concerned in menstruation, and that abnormal uterine bleeding may perhaps be due to aberrations of these other cogs in the menstrual mechanism?

What are these other links in the menstrual chain? What, first of all, is the fundamental cause of menstruation? We have for many years looked on the ovary as primarily responsible for the occurrence of menstruation. Certainly the complete removal of all ovarian tissue as a rule—some say always—causes cessation of menstruation. There is abundant proof that this function of the ovary is dependent on an internal secretion which it contributes to the bloodstream. On the other hand, many facts are known which indicate how intimately the ovarian hormone is bound up with that of many other glands in the body which produce internal secretions. There are some indeed, who maintain that, important as the ovary is to menstruation, the ovarian hormone is not the ultimate cause of the latter. According to this theory, which is suggested by so good an observer as Halban, the ovary is merely the activator of the real underlying cause, which resides in some other part of the body, most likely in some of the ductless glands. It is no longer a mere theory that the ductless glands form a functional chain throughout the body, and that disturbances of any one of them are apt to exert a far-

reaching effect on other members of the group. However indispensable the function of the ovary in menstruation, an important contributory rôle must be assigned to these other organs of internal secretion. There is much evidence of a functional relationship between the ovary and the thyroid, the ovary and the hypophysis, and the ovary and the suprarenals. As regards the other ductless glands, the evidence is not quite so imposing, though many scattered facts point to more or less correlation of function in the case of almost all of them. I shall not here discuss the still disputed question as to which element or elements of the ovary produce the hormone which exerts such a profound influence on menstruation.

How does the ovarian hormone bring about the hyperemia of menstruation? Either it acts directly on the blood-vessel walls or else it produces its effect through the vasomotor nerves. There is some reason for supporting the first of these views, although the second manner of action is more commonly found in the body. Physiologists, I believe, are prone to speak of any relay station in the spinal cord or elsewhere as a “center,” and from this point of view some have spoken of a so-called menstrual center, usually described as being located in the lumbar portion of the spinal cord. While there seems to be no definite knowledge concerning such a center, there is no question that the vasomotor nerves of the pelvis play an important rôle—whether essential or only supplementary we cannot say—in the production of the hyperemia which is perhaps the most conspicuous feature of menstruation. The vasomotor nerves are offshoots of the sympathetic nervous system, and through the rami communicantes are linked up with the cerebrospinal system and even with the psychic centers in the brain. The significance of these facts I shall elaborate later in my paper.

From this brief summary it may be seen that the factors concerned in menstruation are (1) an underlying cause; (2) a nervous mechanism, essentially vasomotor in nature, and (3) the uterus, and especially the endometrium. The cardinal theme of my paper is that uterine bleeding may be due to disturbance or perversion of any of these factors, and that an intelligent study of a given case must embrace a search, not for anatomic alterations alone, but for deviations from the normal physiology as well. In accordance with the foregoing views of normal menstruation, I suggest that the causes of uterine bleeding may be divided into three groups: (1) the fundamental causes, embracing disturbances of the internal secretions, either of the ovary or of some of the other *Blutdrüsen*; (2) the nervous causes, which exert their effect mainly through the agency of the vasomotor nerves, and (3) the anatomic causes, which have to do with structural alterations in the pelvic organs, pelvic blood-vessels or, for that matter, in the blood itself.

A discussion of the last group is scarcely within the province of my paper. I can only repeat that the cause of uterine bleeding is most frequently to be found in this group, which embraces such common conditions as uterine and ovarian neoplasms, adnexal inflammations, incomplete miscarriage, etc. My discussion will therefore be limited to the fundamental and nervous causes of uterine hemorrhage, both of which are admittedly less frequently observed than the anatomic group.

3. Theilhaber: Arch. f. Gynäk., 1902, lxxvi, 1.

4. Pankow: Arch. f. Gynäk., 1906, lxxx, No. 2.

5. Slocum: Surg., Gynec. and Obst., April, 1908.

In the consideration of the fundamental causes of uterine bleeding, we at once find ourselves on very uncertain ground. In the enormous literature concerning the internal secretions, there is much less of fact than of fancy. When the ductless gland faddist, if you choose to call him so, blows his warm breath, on the molecule of fact, it is quite apt to be vaporized into the mountain of hypothesis and speculation. And yet from this great nebula of hypothesis new facts are constantly being crystallized.

As already stated, it is with the ovary that we are primarily concerned in the consideration of menstruation and its various disturbances. The study of the ovarian hormone, like that of the other internal secretions, is much easier along negative than along positive lines. To illustrate, by mere extirpation of the ovaries we may show that cessation of menstruation is due to loss of the ovarian hormone. But it is far more difficult to bring about a condition of hyperfunction of the ovaries, nor is it even certain that such a condition of "hyperoophorism," analogous to hyperthyroidism, may be produced. In the case of the thyroid, mere feeding of the gland extract to a normal person suffices to bring about hyperthyroidism. On the other hand, the possibility of producing hyperoophorism by feeding ovarian extract has been questioned. This is perhaps not surprising when we consider how little we know concerning the nature and characteristics of the ovarian hormone or hormones, and how gradual and inconspicuous would probably be the effect of an excess of ovarian secretion, even though we were sure that this could be produced by mere feeding of the extract. A number of cases have been recorded in which hyperoophorism has apparently been brought about by the latter method. A rather striking case in the recent literature is that of Adler.⁶ It was that of a girl of 21, who had menstruated normally since the age of 15, but who after a short course of an ovarian extract for the first time in her life menstruated four days before the expected time, the flow being much more profuse and lasting longer. After the cessation of the treatment menstruation resumed its old periodicity, duration and intensity.

Much more interesting, however, is the effort of Adler to determine the existence of hyperoophorism in an indirect manner. His method requires a word of explanation. As with the other viscera, the principal nerve-supply of the uterus is derived from the sympathetic. A very revolutionary change is now in progress as regards our ideas of the physiology of the sympathetic nervous system, or, as it is frequently called, the vegetative system. According to the classical description of Langley, the entire vegetative system may be divided into two portions. First, there is the gangliated cord which stretches along each side of the midline of the body, and which may be called the sympathetic system proper. Secondly, many of the autonomic functions of the body are in part regulated by certain cerebrospinal nerves derived principally from the brain and from the sacral portion of the spinal cord. These nerves constitute what is therefore called the craniosacral autonomic system. From the fact that the vagus nerve is the most prominent constituent, this system is also spoken of as the vagal. Kraus, again, speaks of it as the parasympathetic. The distinction between the two systems can perhaps

be best illustrated by the case of the heart. This organ receives its accelerator supply from the sympathetic, its inhibitory supply from the vagus. The former is the whip of the heart, the latter the brake. This antagonism in function is characteristic, being noted in all the other organs, including the uterus. To proceed to the practical application of these facts, it has been found that certain drugs show an elective affinity for one or the other of the two systems. Epinephrin, in accordance with the well-known law of Langley,⁷ affects especially the sympathetic, its injection causing precisely the same effect on an organ as does stimulation of its sympathetic nerve-supply. It is therefore spoken of as a sympathicotropic drug. On the other hand, pilocarpin is perhaps the best-known of a group of drugs which exert a special action on the vagal system, and which are therefore spoken of as vagotropic drugs. To carry the point still farther, it has been found that certain endogenous chemical substances of the body, more particularly the various hormones, exhibit a special influence on one or the other of these two systems. There is reason

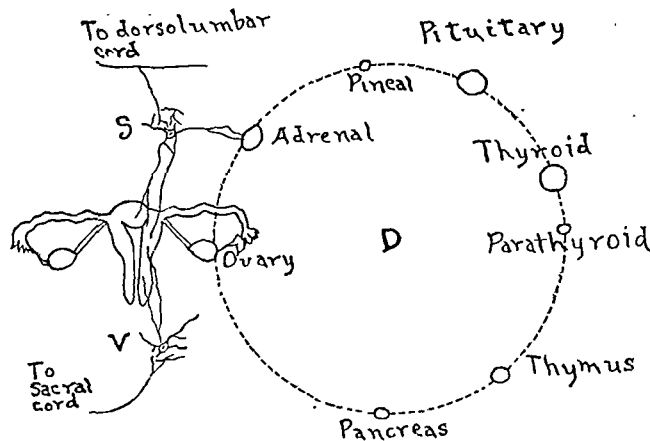


Diagram showing principal physiologic factors concerned in menstruation. *D*, the ductless gland chain, the ovary being the organ most intimately related to menstruation. *S* and *V*, the two physiologic divisions of the vegetative nerve system—the sympathetic proper and the craniosacral autonomic, respectively. Both are traceable to the cerebrospinal system, and the sympathetic is seen to be directly connected with the ductless gland chain, notably at *x*, with the adrenal.

to believe that before very long all the various hormones of the body will be divisible into two groups, one sympathicotropic, the other vagotropic. Much has already been done along this line.

Studies on the ovarian hormone from this point of view are still very meager. The observations of Adler,⁶ however, are worthy of mention. After removal of the ovaries, and to a less extent in cases of ovarian insufficiency manifesting themselves by amenorrhea and genital hypoplasia, he finds that there is an increased susceptibility to small doses of the sympathicotropic epinephrin. On the contrary, in the study of a series of cases of uterine bleeding, he observed no reaction whatsoever to epinephrin, while on the other hand there was a marked susceptibility to even very small doses of the vagotropic pilocarpin. This result he regards as justifying the view that these cases of uterine bleeding were due to overfunction of the ovary.

This conclusion, however, is open to serious question, when we consider that many structures other than the ovary contribute to the characteristic reac-

6. Adler: Arch. f. Gynäk., 1912, xcv, 349.

7. Langley: Schaefer's Text-Book of Physiology, ii.

tions. Even so, however, such work as this is of exceeding value. For perhaps the first time, we are now able to attack the hitherto rather intangible problem of the internal secretions by simple clinical methods instead of by complicated laboratory investigation. Just what practical results will accrue from this new line of endeavor remains to be seen. In the light — or shall I say the darkness? — of our present knowledge of the influence of various hormones on menstruation, the present methods of organotherapy in gynecologic disorders are largely empiric. Until we can put our figurative finger on the specific hormone or hormones at fault, there is little hope of a rational therapy of the various menstrual disorders which are now so indiscriminately treated by various organic extracts. Even before the realization of such an ideal, however, we may hope for advance through studies based on the demonstrated relation between the vegetative nerves and the internal secretions of the body, including that of the ovary. If we cannot definitely determine that uterine bleeding in a given case is due to disturbance of some specific hormone, would it not be a real advance, for example, to be able to say that it is characteristically associated with a condition of vagotony? Even therapeutic possibilities suggest themselves from work along this line.

Though as yet on a small scale, I have entered on the study of this fascinating subject, and as far as uterine bleeding is concerned, have had results in part at least similar to those of Adler. The most marked vagotonic reactions which I have noted have been in four cases of hemorrhage in girls at puberty. In all these cases, the injection of from 1/15 to 1/10 grain of the vagotonic pilocarpin gave a most pronounced reaction, characterized especially by profuse perspiration, a feeling of warmth, salivation, contraction of the pupils, etc. On the other hand, the strongest epinephrin reactions have been noted in women at the menopause. The injection of 1 mg. of epinephrin (about 15 minims of the 1:1,000 solution) caused pronounced tremor, nervousness, a feeling of cold or chilliness, dilatation of the pupils, rapid heart-beat, and rise of blood-pressure. It must not be supposed, however, that such methods will enable us to work out the problem of uterine bleeding by rule of thumb. Many apparent contradictions have occurred in my own work, some of them difficult or impossible of explanation. For details as to the theory and general method of such study, I would refer those interested to the articles of Adler,⁸ Eppinger and Hess,⁹ and Barker and Sladen.¹⁰ My own results I hope to record in detail in a later paper.

Another physiologic factor in the causation of uterine hemorrhage which is closely associated with the activity of the glands of internal secretion has reference to the presence of some local factor in the endometrium which is capable of diminishing the coagulability of the blood and thus predisposing to bleeding. Sturmdorf¹⁰ has suggested that the endometrium, under the influence of the ovarian hormone, manufactures a substance which inhibits the normal coagulability of the blood. The experimental work of Schickele¹¹ and others has led to somewhat similar conclusions. Schickele's results are based on the

study of the inhibiting influence of extracts and expressed juices of the uterus and ovaries on the coagulability of the blood. When there was abnormal bleeding from the uterus, he found that the inhibitory powers of the ovarian extracts are greater than those of the uterus; but when profuse menstrual bleeding was present, it was found that the extracts from the uterus exerted a much greater inhibiting effect on coagulation. This would seem to indicate that bleeding is associated with the accumulation of coagulation-inhibiting substances in the endometrium. Without going into greater detail, I need only say that the work of Schickele indicates that the inhibiting substances are formed in the ovaries and given off in the uterus. When uterine bleeding is present, there is an excessive amount of these inhibiting substances in the uterus. Schickele suggests that this is probably due to over-activity of the ovary, so that ultimately this local physiologic factor in the causation of the bleeding is apparently traceable to a fundamental disturbance in the mechanism of the menstrual process. The occasional success of the operation of curettage in the relief of uterine hemorrhage, even when the endometrium is anatomically normal, may perhaps be explained on the basis of this work, the good result being due to the removal of the inhibiting substance rather than of the endometrium.

As to the dependence of uterine bleeding on disturbance of other internal secretions than that of the ovary, I can only mention the possibilities, accurate observations still being very meager. That a functional relationship exists between the generative organs and the thyroid gland is now a well-established fact. The swelling of the thyroid at menstruation and during pregnancy, and the occasional occurrence of even acute hyperthyroidism after removal of the ovaries, are manifestations of this physiologic correlation. While observations are not unanimous on this point, it seems to be true that hyperthyroidism frequently includes among its other symptoms menorrhagia or metrorrhagia, while hypothyroidism, on the other hand, is more commonly associated with the occurrence of amenorrhea or scanty menstruation. These conclusions are based on the study of outspoken cases of deficient or excessive thyroid secretion, as the case may be. When one considers the frequency of minor grades of thyroid disturbance, and how often they are overlooked, it is easy to appreciate that a certain proportion of cases of uterine bleeding may be thyroid in origin.

Concerning the possible influence of other ductless glands, we can say even less of a definite nature. That the pituitary exerts an influence on menstruation is illustrated in the well-recognized adiposogenital dystrophy of Frölich, due to pituitary deficiency and characterized clinically, among other symptoms, by amenorrhea or scanty menstruation. This being true, one is tempted to believe that the opposite condition, menorrhagia, is perhaps sometimes due to hyperpituitarism. Of this, however, there is no direct proof, and as a matter of fact, many cases of hyperpituitarism appear to be associated with amenorrhea. Here again we encounter the possibility that there is more than one hormone concerned, or that the bleeding is due to a perversion of the secretion — a dyspituitarism — rather than to a simple excess or deficiency. In the case of the adrenals, the work of Bulloch and Sequeira, and many others leaves no reason to doubt

8. Eppinger and Hess: *Die Vagotonie*, Samml. klin. Abhandl. über Path. u. Therap. des Stoffwechsels, Berlin, 1910.

9. Barker and Sladen: *Tr. Assn. Am. Phys.*, 1912, xxvii, 471.

10. Sturmdorf: *New York State Jour. Med.*, 1911, xi, 460.

11. Schickele: *Arch. f. Gynak.*, 1912, xevii, 409.

that these bodies are closely correlated with the generative organs, although there is no evidence as yet that they may be causative factors in uterine bleeding.

We come, finally, to a consideration of the nervous causes of hemorrhage from the uterus. A few years ago it would have been considered only a fanciful hypothesis to attribute to the nervous system a part in the causation of uterine bleeding. When we consider, however, that such a condition as exophthalmic goiter appears often to follow severe nervous shock, and that Crile has demonstrated that the emotion of fright produces definite structural alterations in the brain-cells, we must certainly have greater respect for the nervous system as a disturber, not only of function, but also of structure. There are many functions of the body which are essentially autonomic, but in which a vestige of voluntary control is still evident. In defecation and micturition the control of the will is still an important factor. In the case of such a function as digestion, the voluntary factor is far less important, while in the case of menstruation, to go still farther, the influence of the volitional factor is unrecognizable under normal conditions. And yet even with menstruation the higher centers still retain at least a vestigial degree of control, and under pathologic conditions, this may be greatly exaggerated.

The nervous factor in uterine bleeding has already in a measure been touched on in the discussion of the vegetative nerves as they influence the internal secretion of the ovary. It is scarcely necessary to add that what is true of their influence on the ovarian secretion is equally true as regards their influence on the other internal secretory tissues. No one can as yet say to what extent the influence of these various internal secretions on menstruation is directly chemical, and to what extent it is exerted through the medium of the vasomotor nerves. Like the vasomotor nerves in all other parts of the body, those supplying the generative organs arise ultimately from the cerebrospinal axis, the primary vasomotor center being definitely located in the floor of the fourth ventricle. The center is linked up with the psychic center, thus explaining the occasional occurrence of uterine bleeding as a result of severe emotional disturbance of one form or another. A number of such cases have come under my own observation, of which the following two are typical:

A woman of 42, a multipara, had always menstruated regularly, the flow lasting usually about four days. A menstrual period commenced, Dec. 23, 1913. December 26, as the flow was abating, a Christmas tree in her home took fire, setting the room ablaze. The woman received a severe fright, and within a short while, a profuse hemorrhage set in, lasting for six or eight hours, and then gradually abating.

A girl of 15, who had commenced to menstruate at 13, was brought to the dispensary with profuse uterine bleeding. Her menstruation had never been regular, amenorrhea being frequently noted. There had never previously been any excessive flow. The history given was that an assault on the child had been attempted on the preceding day. On account of the bleeding, it was thought that there might have been some local injury. Examination disproved this, the assault having evidently been unsuccessful. Regular menstruation, lasting three days, had occurred five weeks previously. The hemorrhage in this case was apparently due to the nervous shock associated with the attempted assault.

A number of other cases of this type might be cited. Similar cases are reported by Ehrenfest¹² and others.

That hemorrhage may be of neurotic origin has been abundantly shown by Brown-Séquard, von Recklinghausen and others. There is nothing very revolutionary in such an explanation, for many other phenomena might be mentioned which illustrate the influence of the psyche on processes which in themselves are essentially autonomic—the “watering” of the mouth at the sight or smell of food, the acceleration of the heart from fright or joy, the sweating so characteristic of intense anxiety, etc. Even more apropos, since they illustrate the influence of psychic disturbances on the vasomotor apparatus, are such phenomena as the blush of shame or embarrassment, or the bleeding from the stomach or even from the skin which has been observed in highly nervous or hysteric women. From a theoretic point of view as well as from clinical experience, we may therefore conclude that certain cases of uterine bleeding are undoubtedly neurotic in origin, or, more properly, perhaps, “angioneurotic.”

The close interlocking of the nervous system and the ductless glands makes it possible that severe psychic disturbances produce menstrual aberrations by a direct effect on the functions of the internal secretory glands. Such a phenomenon would be analogous to the glycosuria which has been shown to occur at times in conditions of severe fright and other emotional disturbance, and which is explained as being due to a nervous excitation of the adrenal bodies. This has been corroborated by the failure of the glycosuria to appear if the nerves supplying the adrenals have previously been cut, thus severing the connection of the latter with the psychic centers. I mention this to emphasize the fact that a direct connection between the psychic centers and the ductless gland chain has been demonstrated experimentally. The nervous factor in uterine hemorrhage, like that of the internal secretions, is most apt to make itself manifest at those periods when the woman's menstrual equilibrium is already unstable, that is, puberty and menopause.

SUMMARY

1. The proper basis for the study of uterine bleeding is the study of normal menstruation, along physiologic as well as anatomic lines.

2. The factors concerned in normal menstruation are (a) an ultimate cause, residing in the ductless gland chain; (b) a nervous mechanism, essentially vasomotor in character; (c) the pelvic organs, and especially the uterus.

3. The causes of uterine bleeding may therefore be grouped as (a) fundamental, involving disturbances of the internal secretions; (b) nervous, exerting their effect mainly through the vasomotor nerves; (c) anatomic, in which structural changes are present in the uterus or other pelvic organs.

4. Most frequently the exciting cause of uterine hemorrhage is anatomic, the lesion being in the uterus, tubes, ovaries, blood-vessels or even the blood itself.

5. In a not inconsiderable number of instances, bleeding is due to fundamental or nervous causes, especially at the two extremes of menstrual life, puberty and the menopause.

6. There is good reason to believe that much light will be thrown on the rôle of the fundamental causes, and perhaps even of the nervous causes, by clinical methods of study which are based on the relation known to exist between the ductless gland apparatus and the vegetative nerve system.

330 North Charles Street.

12. Ehrenfest: Amer. Jour. Obst., February, 1908.

RADIUM IN THE TREATMENT OF UTERINE
HEMORRHAGE AND FIBROID TUMORS *

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AND

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BALTIMORE

The association of several diverse pathologic conditions may occasion surprise. Our excuse for presenting them together in this instance is that they have certain characteristics in common, namely, they are all benign, all chiefly troublesome on account of hemorrhage, and all remarkably united in their ready response to ray-therapy.

Until recently the control of uterine hemorrhage and the relief of symptoms of pressure occasioned by fibroid tumors have been possible with certainty only by radical surgical procedures.

The benign conditions which we wish to consider in this paper fall readily into four groups, excluding uterine hemorrhages due to cancer and other malignant disease, as well as those due to inflammatory disease of the adnexa, and those due to pregnancy and miscarriage.

The first group includes cases in adult women in which there is marked menorrhagia or metrorrhagia with no disease of the pelvic organs, except perhaps a slight enlargement of the body of the uterus. The endometrium taken from such uteri is microscopically normal. These cases belong to the so-called myopathia hemorrhagica class.

The second group takes in most of the hemorrhages which occur in young girls. In many of these the local findings are exactly as in Group 1. In some instances the condition is similar to that found in Group 3 (polypoid endometrium). Although pathologically this group cannot be separated from the others, it presents marked and distinctive features clinically, and in especial it differs radically in the indications for treatment. It is most important with these patients to avoid both sterility and mutilation.

The third group includes patients suffering with uterine hemorrhages who show no pathologic condition except an extensive polypoid overgrowth of the endometrium, which is generally termed polypoid endometritis.

The fourth group includes true uterine myomas, whether they are causing hemorrhage or merely giving discomfort through pressure on adjacent organs. Here the true aim of treatment is not only to regulate or stop the bleeding, but also to bring about the complete disappearance of the tumor.

MODE OF ACTION OF ROENTGEN AND RADIUM RAYS
ON UTERINE HEMORRHAGIC CONDITIONS,
ESPECIALLY FIBROID TUMORS

It has been firmly established both from animal experimentation and clinical observations on human beings that the Roentgen ray and the penetrating rays from radium are capable of destroying the primordial follicles of the ovary and the spermatogenic cells of the testicle. We have but to mention the names of Albers-Schoenberg, Brown, Osgood, Halberstaetter, Fraenkel, Faber, and many others who have contrib-

uted to our accurate knowledge in this direction. As it is the primordial follicles which give rise to the corpora lutea and determine menstruation, these results suggested at once that the penetrating rays might offer a means of causing amenorrhea and sterility. From the older literature it was known that many fibroids ceased to bleed and grew smaller after a double oophorectomy. A case of complete disappearance of a large fibroid tumor after this operation occurred in the service of one of us (H. A. Kelly) at the Johns Hopkins Hospital and is reported.¹⁰ Reasoning on the basis of similar experiences, it was felt that the ray therapy had its primary effect on the ovaries and secondarily controlled the pathologic conditions in the uterus. Most of the technics devised for radiation based on this idea have particularly endeavored to concentrate a maximum amount of rays on the ovaries, leaving the tumor more or less out of consideration.

It has been well established both from Roentgen-ray and radium radiation that an obliterative endo-arteritis occurs almost invariably in the field radiated. We have noticed this condition in a marked degree in a number of cases in which we have operated after extensive radiation with radium. The natural conclusion therefore is that the effect on a fibroid tumor is due to the anemia following the occlusion of its nutritive vessels.

Against the conception that the influence on fibroids is mainly indirectly through the ovaries are the facts that many fibroids grow after the menopause, that some grow after the removal of the ovaries, and that marked regressions occur in tumors treated by the ray method in patients past the menopause. For these reasons we believe that there is a *specific and direct action of the rays on the tumor itself*, and we further believe that this happy result can be secured *quite independently of any action on the ovaries*. In the series of fibroids to be recorded in two cases the tumor disappeared without cessation of menstruation! In another already past the menopause there has been marked regression from a single treatment!

TECHNIC

In the tables we give with each case the amount of radium and the duration of the application. The reader will observe at once a wide variation in the individual cases. While we feel that the results given can all be duplicated by the same technics, we do not consider the matter of dosages in any sense settled. Our plan has been steadily to increase the milligrammage while decreasing the time. This is not only for economy and comfort to the patient but because of the better results and fewer complications occurring. The ideal method, where it is not desired to secure amenorrhea, is to limit the radiation so far as possible to the tumor itself, avoiding touching the ovaries. This is best secured by intra-uterine applications. It is sometimes well to reinforce such treatments by abdominal radiation either with radium or the Roentgen ray.

The technic advised is filtration through glass 0.5 mm. of platinum, 0.5 mm. of zinc foil, and 0.3 mm. of rubber. Such an apparatus, suitable shaped, is carefully introduced directly into the uterine cavity. Cervical applications alone we find to be less reliable, demanding much more radiation to secure results. As a preliminary to the introduction of the radium, the patient is given nitrous oxide and then thoroughly curetted, and examined carefully under complete anes-

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

* On account of lack of space this paper has been abbreviated for THE JOURNAL. It will appear in full in the Transactions of the Section and in the author's reprints.

10. Kelly and Cullen: Myomata of the Uterus, 1909, p. 505.

TABLE 1.—FIRST GROUP BLEEDING UTERI "MYOPATHICA HEMORRHAGICA"

No.	Name	Age	Date	Duration	Severity	Previous Treatment	Pelvic Examination	Treatment	Immediate Results	Complications	Final Results
289	Case 1 Miss L. H.	44	9/ 3/13	6 months	Marked bleeding; anemic	Medicinal. No benefit.	Normal organs	100 mg. 24 hrs.	Nauseated 3 days; no fever; abdom. tenderness 2 weeks.	None	Slight menstrual period October 3. None since. General health splendid. Slight menopaual symptoms.
291	Case 2 Mrs. R. S.	38	9/11/13	2 years	Rather severe; marked anemic.	Medicinal only. No benefit.	Normal organs	80 mg. 24 hrs.	24 hrs. nausea; abdom. discomfort 3 weeks. some discharge; leukorrhea.	None	Slight period October, 1913. None since. Splendid health. No menopaual symptoms.
335	Case 3 Miss S. McL.	27	10/22/13	2 years	Very severe; anemic.	Local applications iodine, repeated curettings without result.	Normal organs	100 mg. 9 hrs. 10/23; 60 mg. Ra. 18 hrs., 12/1/13.	Menstruation November and December; slight nausea for 24 hrs.	None since	Complete amenorrhea. No menopaual symptoms; general health splendid.
383	Case 4 Mrs. F. M.	42	11/14/13	1 year	Very severe; anemic.	Medicinal. No benefit.	Slight enlargement of uterus.	60 mg. 10½ hrs.	None	None	Slight bleeding in December. None since. Slight menopaual symptoms.
385	Case 5 Mrs. J. D.	41	11/18/13	4 years	Very severe; marked anemic.	Local applications; general medication; curettement.	Uterus size of 6 weeks' pregnancy.	70 mg. 12 hrs.	Nauseated 1 day; headaches; some abdominal pain 2 weeks.	None	Menstrual period in December. None since. General condition excellent. Uterus reduced to normal size. Marked menopaual symptoms.
348	Case 6 Mrs. J. H. H.	45	12/18/13	1 year	Excessive; anemic.	Medicinal. No benefit.	Normal organs	100 mg. 6 hrs.	No discomforts	None	In January normal period. Since then no bleeding. No menopaual symptoms. Splendid health.
272	Case 7 Mrs. A. B.	28	7/21/13	Several years	Marked upset; marked anemic; general weakness.	Curettements, local applications, general medication; no benefit.	Normal organs	60 mg. 24 hrs.	Nauseated 2 or 3 days; uterine discharge 2 weeks; slight abdominal discomforts 2 weeks.	None	No further menstrual periods. Slight menopaual symptoms. Splendid general health.
786	Case 8 Mrs. C. R. C.	39	4/18/14	4 months	Severe; anemic.	Curettement; medicinal; no benefit.	Normal organs	268 mg. 2 hrs.	None	None	No further menstrual periods to date. Apparently cured. No menopaual symptoms.

TABLE 2.—SECOND GROUP: BLEEDING UTERI IN YOUNG GIRLS

No.	Name	Age	Date	Duration	Severity	Previous Treatment	Pelvic Examination	Treatment	Immediate Results	Complications	Final Results
176	Case 1 Miss F. P.	13	7/ 5/13	1 year with onset of periods.	Irregular, prolonged, severe.	Medicinal	Normal organs; normal endometrium.	20 mg. 5 hrs.	None	None	Normal periods since treatment.
377	Case 2 Miss E. W.	23	11/13/13	Difficulty since onset of periods; very bad 2 yrs.	Moderate; anemic.	Repeated curettings; medicinal; resection of ovaries.	Normal organs; normal endometrium.	12 mg. 7¼ hrs.	None	None	Normal regular periods since treatment.
361	Case 3 Miss E. N.	16	11/ 4/13	2 yrs. since onset.	Quite severe.	Curettings; general medicinal.	Normal organs; normal endometrium.	60 mg. 12 hrs.	None	None	Normal regular periods up to present time.
186	Case 4 Miss A. R.	19	6/ 4/13	1 year	Continuous; not particularly severe; anemic.	Curettement; medicinal.	Normal organs; excessive endometrium; polypoid.	55 mg. 24 hrs.	No menstrual periods for 2 months; some abdominal tenderness.	None	Normal menstruation has returned; patient in splendid condition.
30	Case 5 Miss H. B.	20	2/ 7/13	Several years' irregular bleeding.	Very severe; complicated by organic heart disease.	Curettement; medicinal.	Normal organs; normal endometrium.	400 mg. 7 hrs.; abdominal application.	Nausea; slight rise in temperature.	None	Complete cessation of menstruation; artificial menopause. Some menopaual symptoms.

thesia; this is indispensable to good work. The amounts used intra-uterine in the fibroid cases have varied from 30 mg. to 560 mg. and the time of application from one and one-half hours to forty-eight. In the young girl class the amount of radium introduced has been as small as 12 mg. In speaking of milligrams radium element is meant; whatever the salt and whatever its purity, in all reports the amount in equivalent of radium element pure should be given. In the case of mesothorium, which varies with age, the strength equivalent to radium element at the time of radiation should also always be stated.

In conjunction with Dr. Robert M. Lewis and other workers of the Howard A. Kelly Hospital we have been using radium in the treatment of these bleeding cases for a year and a half and have had in all 39 cases: 8 hemorrhagic metropathies, 5 polypoid endometria, 5 irregular bleedings in young girls, and 21 cases of uterine fibroid tumors. All of these latter have belonged to the class of large or medium tumors, none to the group of small tumors to which the treatment is limited by Chéron.

In the first group, that of bleeding uteri of adult women without any demonstrable pathologic lesion, the eight cases are summarized in Table 1. The average age is 38 years, the youngest 27, the oldest 44. All were suffering from anemia and had not yielded to the palliative measures previously applied. The amounts of radium used varied from 60 to 268 mg., the time of exposure from two to twenty-four hours. In two cases (7 and 8) the bleeding never recurred after the first treatment. In one case (3) a second treatment was necessary. In the remaining 5 cases a normal menstrual period followed at the regular time to be followed by complete amenorrhea. The average time from treatment to complete amenorrhea was 3½ weeks. Mild menopausal symptoms occurred in 3 cases, marked menopausal symptoms in one case, and none in 4 cases. The patients all left the hospital within forty-eight hours and except for a slight abdominal burning which lasted two or three weeks and which was accompanied by some leukorrhea, have had no bad results. All now report themselves in good health.

In the third group, of adult women with uterine hemorrhage and no disease except a polypoid endometrium, there are 5 cases the details of which are given in Table 3. The average age was 43 years; the oldest 49 years, the youngest 35 years. Except in Case 1, in which a combined uterine abdominal and vaginal application was used, only the intra-uterine method was used. The amount of radium employed varied from 100 to 30 mg. The duration of the treatment was from twenty-two to seven hours. With the exception of Case 1, in which bleeding led to hysterectomy five days after application, all were relieved at once by the single application. All these patients were anemic, all had resisted other forms of treatment, all have regained their normal condition since treatment. In 2 cases menopausal symptoms were slight. In 2 cases they were not present. Case 1 is not included as here oophorectomy and hysterectomy was carried out.

In the second group, which includes young girls who were bleeding, there are 5 cases, the tabulation of which is given in Table 2. The ages varied from 13 to 23, the average being 18 years. In addition to the usual medicinal treatments, all but one had had curettages and one had had a resection of the ovaries, with

TABLE 3.—THIRD GROUP: BLEEDING UTERI FROM POLYPOID ENDOMETRIUM

No.	Name	Age	Date	Duration	Severity	Previous Treatment	Pelvic Examination	Treatment	Immediate Results	Complications	Final Results
129	Case 1 Mrs. R. L.	49	2/16/13	3 years	Intermittent; very severe; marked anemia.	Medicinal; local applications; curettage.	Normal organs; excessive endometrium; polypoid.	50 mg. in uterine cavity; 100 mg. in vagina; 100 mg. on abdomen 22 hrs.	Marked nausea and vomiting for 24 hrs.	Continued hemorrhage; hysterectomy 5th day; abdominal tenderness 3 weeks.	Well-marked menopausal symptoms.
88	Case 2 Miss N. H.	35	5/24/13	1 year	Quite severe; marked anemia.	None	Normal organs; excessive endometrium; polypoid.	30 mg. 18 hrs.	Nausea a day or two; uterine discharge 1 month.	None Abdominal tenderness 2 weeks.	No menstruation since treatment; no menopausal symptoms.
245	Case 3 Miss J. W.	47	6/24/13	9 months	Rather severe; marked anemia.	Medicinal only	Normal organs; polypoid endometrium.	70 mg. 16 hrs.	Slight nausea	None Abdominal tenderness several weeks.	No further bleeding; menopausal symptoms mild in 2 months from treatment.
271	Case 4 Mrs. A. H.	40	7/14/13	2 months	Continuous; severe; marked anemia.	None	Normal organs; polypoid endometrium.	50 mg. 24 hrs.	Nausea and vomiting 1 day.	No further menstrual periods; slight menopausal symptoms; abdominal tenderness 1 month.	No further menstruation; slight menopausal symptoms.
758	Case 5 Mrs. A. B.	43	3/4/14	4 or 5 years	Very severe; marked anemia.	Medicinal; frequent curettages; reduction of uterus by operation.	Small normal uterus; other organs normal; polypoid endometrium.	100 mg. 7 hrs.	Nausea; slight headache	None	Entirely well; no menopausal symptoms.

the idea of diminishing the period. All were in general good condition except for the anemia, with the exception of Case 5, in which there was extreme organic heart disease. The amount of radium used varied from 12 to 60 mg. The time of application ran from five to twenty-four hours. In the first three cases the menstrual periods have returned to the normal type and the patients recovered a normal hemoglobin content.

In Case 4 there was amenorrhea lasting two months, then a return of menstruation, which has been a little irregular at intervals of from three to five weeks but never excessive. In the fifth case, where the application was through the abdominal wall, complete amenorrhea with distinct menopausal symptoms was produced. Where we desire to diminish hemorrhage the treatments are short and the milligrammage small, although it is harder to produce a complete amenorrhea in this group than in women over 40.

In the fourth group, which includes the fibroids, there are 21 cases; the average age is 44; the oldest 59 years; the youngest 32 years; menorrhagia, metrorrhagia or both, were present in 19 cases; in one there was normal menstruation, in one no menstruation, as patient was six years past menopause.

The tumors with one exception (Case 10, Table 4) were either large or middle sized. By large we mean those reaching half way to the umbilicus or larger, while middle-sized tumors include those from the size of a two and a half months' pregnancy half way up to the umbilicus.

In 3 cases the tumor was definitely submucous. With the exceptions of Case 5, in which there was an ovarian cyst, and Case 16, a cystic ovary, and Case 20, chronic pelvic inflammatory disease, and Case 8, marked exophthalmic goiter, and Case 10, infection of the tumor and uterine cavity, the fibroid condition was uncomplicated. The amounts of radium and the duration of the application are shown in Table 4.

In Case 8 the application was atypical, in that radiation had been given with the Roentgen ray both prior to and after the radium radiation. Owing to the extreme illness of this patient the ordinary technic was not followed and the application was made through the abdomen. In Case 21, the only failure in the group, the application was also atypical, from the abdomen and from the cervix. At the time this patient was treated it was not realized that the intracervical treatments require much longer times of exposure. Here, owing to the tortuosity of the cervical canal, the introduction of the tubes into the uterus was difficult. After the failure, however, it was thought better not to radiate further, but to treat surgically.

These patients almost invariably suffer from nausea for twenty-four hours, and from abdominal tenderness for from ten days to three weeks, and some of them have leukorrheal discharge for a few weeks. The symptoms above enumerated have been much less marked when large amounts of radium are used for relatively short times. In only one case, No. 20, has any serious complication followed the treatment. Here an inflammatory process was lighted up and a pelvic abscess formed. It healed, however, without operation, and the patient is perfectly well to-day.

EFFECTS ON HEMORRHAGE

In 16 of the 21 cases, complete amenorrhea has been obtained; immediately after the treatment in 6 cases, at the end of one month in 4 cases, at the end of two

months in 4 cases, at the end of several months in one case (3) in which the milligrammage and hours were small. In one case the patient is six years beyond the menopause and there was no bleeding. In one case, No. 21, the treatment failed. In one case, the time since treatment is too short to state the effect. In two cases, and these in our opinion are most important, *the menstrual periods have persisted regularly and the tumors have disappeared*. The details of these two are shown in Table 4, Nos. 4 and 11.

This happy result must be due to the fact that the fibroid has received much more intense radiation than the ovaries, and serves to point the way in which to extend our efforts in this field, that is, *to secure a maximum effect on the tumor with a minimum treatment of the ovaries*. This observation, which reverses the European technic, is possibly applicable to Roentgen ray as well as radium treatments.

The effects on the tumor are as follows:

Case 1, from the size of three months' pregnancy to six weeks' pregnancy.

Case 2, tumor 4 inches in diameter has completely disappeared.

Case 3, tumor 6 inches in diameter has completely disappeared.

Case 4, uterus and tumor size of three month's pregnancy reduced to size of normal uterus.

Case 5, tumor 9 inches in diameter reduced to one 4½ inches in diameter.

Case 6, a huge tumor filling pelvis and lower abdomen has entirely disappeared.

Case 7, uterus and tumor size of a two months' pregnancy reduced to the size of a normal uterus.

Case 8, no report on size of tumor, except that it is markedly smaller.

Case 9, huge tumor filling pelvis and abdomen to umbilicus reduced to the size of a two and one-half months' pregnancy.

Case 10, uterus and tumor the size of three months' pregnancy now a normal uterus.

Case 11, tumor reaching to within 1 cm. of umbilicus reduced to the size of a six weeks' pregnancy.

Case 12, tumor 5 inches in diameter reduced to 2½ inches in diameter. Duration of observation only six weeks.

Case 13, no report obtained.

Case 14, tumor 6 inches in diameter reduced to 1 inch in diameter.

Case 15, tumor size of four months' pregnancy reduced to that of a six weeks' pregnancy.

Case 16, tumor size of four months' pregnancy reduced to one of six weeks' pregnancy.

Case 17, uterus size of three months' pregnancy reduced to a normal uterus.

Case 18, huge tumor filling pelvis and lower abdomen to umbilicus reduced to one-third original size.

Case 19, six years past the menopause, tumor 6 inches in diameter reduced to one 3 inches in diameter, and still decreasing.

Case 20, uterus twice normal size, reduced to normal size.

Case 21, practically no change in size of tumor which is about 4 cm. in diameter.

With intense radiation of the fibroids, the reduction is usually rapid, occurring within two or three months. Where the principal effect has been on the ovary, the disappearance may be much slower extending over months or even years, as in the cases reported by Robert Abbé.⁶

TABLE 4.—FOURTH GROUP: MYOMATA UTERI

No.	Name	Age, yrs.	Date	Duration	Hemorrhage	Size and Position of Tumor	Condition of Other Pelvic Organs	Treatment	Immediate Results	Complications	Final Results
0	Case 1 Mrs. E. R. W.	45	3/18/13	6 months	Menorrhagia, 10 days; clots profuse; some anemia.	Subperitoneal and interstitial uterus and fibroid size of 3 months' pregnancy.	Normal	30 mg. for 48 hrs.	Nauseated 24 hours. No fever. Abdominal discomfort several weeks.	None	Leukorrheal discharge for 2 months. Moderate period in April and May, none since. Uterus size of 6 weeks' pregnancy. General health splendid. Marked menopausal symptoms.
	Case 2 Miss E. G. E.	35	3/23/13	1 year	Menorrhagia, excessive, 10 days; moderate anemia.	Interstitial; 4 inches in diameter	Normal	30 mg. 48 hrs. 3/25/13 38 mg. 48 hrs. 5/1/13 55 mg. 24 hrs. 1/1/14	Nauseated headaches and leukorrhea.	None	Good deal of pain and aching in the back and abdomen. Between May and November regular 3-day periods, scant. Excessive in December. Uterus slightly smaller. No period after January. Uterus normal. Feels splendidly.
175	Case 3 Mrs. F. P.	44	5/17/13	1 year	Rather marked; 7 or 8 days; menorrhagia.	Interstitial; indistinguishable from uterus; 6 inches in diameter; one-half inch between symphysis and umbilicus.	Normal	80 mg. 24 hrs.	Some nausea and vomiting for 24 hours.	None	Moderate flow in June, 1 day in July. No further bleeding. Mild menopausal symptoms. Uterus normal in size. Most of the decrease before December, 1913.
119	Case 4 Miss K.	46	5/27/13	4 months	Menorrhagia, 10 days.	Just reaching out of the pelvis; interstitial; little larger than a 3 months' pregnancy.	Normal	50 mg. 24 hrs.	No discomfort.	None	Missed June period; moderate menstruation in July. No menstruation between July and November. In November fibroid plainly felt in anterior wall 4 cm. in diameter. From December on regular menstrual periods of 3 days' duration. Fibroid entirely gone.
274	Case 5 Mrs. A. A. W.	51	7/22/13	3 years	Menorrhagia; marked anemia apparent.	Interstitial, subperitoneal, submucous; 9 ins.; diameter far up in abdomen.	Ovarian cyst of right ovary 18 in. in diameter.	60 mg. 47 hrs.	Nauseated for 48 hours. Abdominal distress for several weeks mild.	None	No further hemorrhage whatever. By October 25 fibroid reduced to one-half original size. Entirely intrapelvic. Ovarian cyst no more than 1½ inch in diameter. Same condition in June, 1914.
281	Case 6 Miss M. B.	33	8/25/13	2 years	Marked menorrhagia.	Interstitial and subperitoneal; fills entire pelvis and extends 4 fingers above umbilicus.	Normal	120 mg. 18 hrs.	Nauseated, vomiting, some temperature for some days.	For nearly 2 mos. marked discharge; some afternoon temperature	Irregular bleeding for 2 months. Then complete cessation. Very mild menopausal symptoms. Splendid general health. Tumor entirely disappeared.
324	Case 7 Miss E. B.	43	10/ 4/13	2 or 3 years	Menorrhagia low days; very low hemoglobin; menorrhagia for 1 month before treatment.	Interstitial and subperitoneal; uterus size of 2 months' pregnancy; one subperitoneal nodule 1 inch in diameter.	Normal	80 mg. 24 hrs.	Nauseated for 24 hours. Some leukorrhea and abdominal tenderness for 4 weeks.	None	One moderate period in December. Complete amenorrhea. Uterus normal in size. Slight menopausal symptoms. General health splendid.
332	Case 8 Mrs. M. M.	40	10/ 7/13	4 years	Menorrhagia and metrorrhagia; 40 per cent. condition of exophthalmic goiter complicates situation.	Subperitoneal, interstitial, submucous; immense tumor filling entire pelvis and lower abdomen to level of umbilicus.	Not made out.	Abdo. 734 mg. 6 hrs. 484 mg. 4 hrs.	Thyroidism, nausea and vomiting, for a week. Rather high fever.	Thyroidism	Patient had Roentgen-ray treatment by Dr. Stern of New York. Although tumor decreased bleeding continued in November and December. Further Roentgen-ray treatments were given by Dr. Stern. Amenorrhea reached in January. Since then no bleeding. General health has been excellent. Tumor reported to be much smaller.

TABLE 4.—FOURTH GROUP: MYOMATA UTERI—(Continued)

Case	Age	Date	Duration	Menstruation	Uterus	Not made out	100 mg. 12 hrs.	Marked nausea; fever for	None	Since the treatment in January no hemorrhages. On several occasions slight bleeding. Uterus now size of 2½ months' pregnancy, freely movable. Hemoglobin and general condition excellent.
475	Miss A. D. S.	48	1/4/14	4 years	Marked menorrhagia; marked anemia; 30 per cent. hemoglobin; foul discharge; daily fever.	Not made out	100 mg. 12 hrs. April 25 on abdomen 1 hr. 40 min.	Marked nausea; fever for 10 days; purulent discharge from uterus.	None	Since the treatment in January no hemorrhages. On several occasions slight bleeding. Uterus now size of 2½ months' pregnancy, freely movable. Hemoglobin and general condition excellent.
637	Case 10 Miss O. F. E.	40	2/22/14	7 years	Menorrhagia and metrorrhagia; marked anemia and general symptoms from anemia; shortness of breath; hemoglobin 50 per cent.	Normal	100 mg. 10 hrs.	Nausea and considerable upset for 2 days; abdominal tenderness and miserable feeling for 6 weeks which kept her in bed.	None	No menstrual period after a moderate one in March. Reports she is feeling splendidly, better than for years. The growth has entirely disappeared.
681	Case 11 Miss B. S.	39	3/16/14	About 1 year	Menorrhagia and metrorrhagia; marked anemia.	Normal	300 mg. 1½ hrs. April 25 1,100 mg. 2½ hrs. on abdomen.	Twenty-four hours nausea; soreness in abdomen for 10 days; temperature 1 degree above normal for 8 hrs.	None	Normal menstrual periods in March, April, May and June. On April 25 growth one-half original size. On June 14 growth found to be entirely gone.
825	Case 12 Mrs. A. L.	38	4/30/14	1 year	Menorrhagia marked.	Normal	560 mg. 3 hrs.	Little nausea	None	Rather profuse menstrual period in May. None up to present time in June; growth is about half original size.
771	Case 13 Mrs. L. H. C.	44	4/20/14	1 year	Menorrhagia 10 days, but not very anemic looking.	Normal	400 mg. 1½ hrs.	None	None	No report secured.
533	Case 14 Mrs. C. N. B.	43	10/8/13	4 years	Menorrhagia	Normal	60 mg. 24 hrs. 300 mg. 21 hrs. from abdomen.	Nausea 3 or 4 days, marked discomfort in pelvis for 1 month.	None	No further menstrual period; general health splendid; uterus normal in size, small, attached to its right wall; a small pedunculated myoma 1 in. in diameter.
334	Case 15 Mrs. C. E. D.	40	10/20/13	2 years	None	Normal	100 mg. 26 hrs. 60 mg. on abdomen 1½ hrs.	Nausea for 24 hours.	None	Normal menstrual period in November; none since then; general condition splendid; no menopausal symptoms; tumor practically gone; uterus freely movable; slightly larger than normal; no fibroid can be felt.
370	Case 16 Mrs. H. W. T.	59	11/6/13	4 years	Although 59 yrs. old patient is apparently still menstruating; for 4 years has been having irregular excessive menstrual periods.	Apparently cystic left ovary.	100 mg. 24 hrs.	No upset.	None	No further bleeding; splendid health; growth reduced to one-third original size.
394	Case 17 Mrs. A. McG.	16	11/18/13	2 years	Rather marked menorrhagia; symptoms of pressure.	Normal	60 mg. 17½ hrs. 60 mg. 2 hrs. 1/6/14.	Period in December, rather excessive; none since.	None	Feels splendidly; no menopausal symptoms; no bleeding; tumor entirely gone.
375	Case 18 Mrs. W. T. D.	33	12/10/13	1½ years	Menorrhagia 8 days.	Not made out	60 mg. 18½ hrs.	No disturbance.	None	One menstrual period; since then complete amenorrhea; growth reduced to one-third original size; splendid health.

TABLE 4.—FOURTH GROUP: MYOMATA UTERI—(Continued)

No.	Name	Age	Date	Duration	Hemorrhage	Size and Position of Tumor	Condition of Other Pelvic Organs	Treatment	Immediate Results	Complications	Final Results
792	Case 19 Miss M. L. C.	49	4/25/14	At least 10 years.	None. Patient is past menopause 6 years.	15 cm. in diameter, in right broad ligament; uterus to left of tumor; size of 6 weeks' pregnancy.	Normal	150 mg. 6 hours	None except leukorrhoeal discharge.	None	June 5 tumor only 7 cm. in diameter; general condition of patient excellent.
614	Case 20 Mrs. A. H. M.	46	2/6/14	1 year	Very marked menorrhagia; marked anemia.	Uterus about twice normal size; one sub-peritoneal fibroid on anterior wall measures 4 cm. in diameter.	Pelvic inflammatory disease; chronic	170 mg. 13 hrs. 15 min.	Nausea and vomiting; some temperature; abdominal pain for 3 weeks.	Lighting up of pelvic inflammatory disease with formation of pelvic abscess.	No further menstrual periods; pelvic abscess healed spontaneously; no menopausal symptoms; uterus normal in size; general condition splendid.
340	Case 21 Miss A. A.	32	10/8/13	2 years	Menorrhagia 8 days.	Uterus 10 cm. in diameter, round and globular.	Normal	30 mg. 25 hrs. 10/19/13 300 mg. 11 hrs. abdominal, 10/19/13 35 mg. 10 hrs. 11/18/13 35 mg. 12 hrs. 11/20/13 60 mg. 25 hrs. 1/7/14 400 mg. 6 hrs. abdominal 1/7/14	No upset except nauseated a few hours after application.	None	Neither tumor nor hemorrhages markedly changed. The applications here were to the cervix and not intra-uterine. Radical operation carried out 3/14/14.

CONCLUSION

We feel sure as the result of these remarkable experiences that radium offers a marvelous means for controlling, as well as for completely doing away with uterine hemorrhages, in the classes of cases cited.

We believe also that it is perfectly suited to secure the disappearance of fibroid tumors. A radium treatment ranks in severity as scarcely more serious than a simple uterine curettage.

In its brilliancy of curative results it is fully equal to radical surgical procedures while offering the advantages of freedom from danger, pain, suffering and the various postoperative complications and sequelae. Furthermore, when radium fails we still have the operation to fall back on and have not lost in the waiting. As compared with the Roentgen ray, radium is simpler of application, more rapid in bringing about the desired effect, and finally is better in that it acts on the diseased organ, the uterus, with more intensity than on the ovaries. Radium offers the possibility in the fibroid cases of doing away with the tumor without destruction of the ovaries.

We also insist that the fibroid itself should receive the major radiation, whether with the Roentgen ray or with the radium.

The radium can bring about a complete amenorrhea at any age.

The menopausal symptoms which follow this amenorrhea are absent in 50 per cent. of the cases and mild in nearly all of them.

We insist on the intra-uterine application, in contradistinction to the vaginal or cervical, and in this connection wish to contrast the shortness of the radiations in hours as compared with the exposures reported by Chéron⁸ and Gauss and Krinski.⁹ We feel that it is quite possible that suitable abdominal radiation with radium or the Roentgen ray may add to the rapidity of the results.

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ROENTGENOTHERAPY IN UTERINE HEMORRHAGE*

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The treatment of uterine hemorrhage by means of the Roentgen rays, is no longer a novelty, but has become an established method in most of the leading clinics in Europe, and is being well established in America. The first cases were treated and placed on record ten years ago by Deutsch. Since then reports have been made by several hundred roentgenologists and gynecologists, and the number of cases now definitely recorded are considerably over a thousand. There has been sufficient time for all the doubts and fears to have materialized, but instead, all hopes have been realized, the technic has been fairly well established, and the indications and contra-indications reasonably well outlined, so that to-day the method stands as one of the most brilliant achievements of roentgenology.

In 1904 Deutsch¹ found that the rays relieved four cases of uterine hemorrhage connected with fibroids. This report seemed to have been forgotten until

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.
1. Deutsch: Die Radiotherapie bei Gebärmuttergeschwülsten, München. med. Wchnschr., 1904, p. 1646.

Foveau de Courmelle² made a report on forty-five cases of uterine fibroids in 1906, and on fifty-three in 1907. I³ began treating these cases in January, 1906. Since then the publications on this subject have been so numerous that it would require all the time allotted to me for this paper, if I only referred to them.

THEORY OF THE ACTION OF THE ROENTGEN RAYS IN GYNECOLOGY

It has been proved by experiments on animals and human beings (Albers-Schonberg,⁴ Phillips,⁵ Halberstaedter,⁶ Heineke,⁷ and others), that the ovaries and testicles are the most sensitive of all the tissues of the body to the action of the Roentgen rays, and that these organs can be seriously affected without producing visible effects on the overlying skin. It is likely that the results referred to in this paper are chiefly due to this special action of the rays on the ovaries, and secondarily to their direct effect on uterine fibromas, the uterine tissue, and malignant cells, when present.

If the activities of the ovaries send out a stimulus to prepare the mucous membrane of the uterus for the reception of the ovum, and the degree of this stimulation governs the menstrual flow, then the depression of this function will decrease the menstrual flow and finally lead to its obliteration. This lack of congestion and nutriment probably leads to an atrophy of the fibroids. By decreasing the hemorrhage, at least such pains as are due to the expulsion of the clots will be relieved, and by decreasing the functions of the ovaries there is probably a decrease in the irritability of the nervous mechanism of the ovaries, thus bringing about, consequently, a relief in the dysmenorrhea of neurotic subjects.

Saretzky,⁸ in a series of experiments on sixty-two rabbits, found the ovarian tissue to be especially sensitive to the rays, and, of the ovarian tissue, the ripe and ripening follicles were first affected. Only the weakest dose showed no effect. Progressively increasing doses affected, in proportion to the quantity of treatment, first the ripe and ripening follicles, then the pre-follicular cells and, finally, the interstitial tissue.

At certain stages he found that a beginning atrophy of the follicles undergoes a regeneration, the ovarian tissue develops anew and the ovaries entirely regain their functions. If the treatment is persisted in, however, a complete atrophy takes place. He found that if only one ovary was treated, the other ovary and the entire genital tract retained their normal functions, and the animal was capable of reproduction.

Based on these theories and experiments, we easily find the explanation of the fact that, as we approach the menopause, the quantity of treatment needed to produce sterility and an artificial menopause is very much less than is needed in younger patients in whom the functions of the ovaries is very much more active, and the resistance greater. The resistance of the ovaries in younger people is sometimes remarkable, and on this account the Roentgen-ray treatment is not

the method of choice in patients under 40 years of age. One patient, aged 34, whom I treated over the spleen and abdomen for chronic cyanotic polycythemia and who received a great deal of treatment over the pelvic region during two and a half years, became pregnant and gave birth to a healthy child who is now 4 years old.

Good results of roentgenotherapy, as given by Albers-Schonberg in 1909 and confirmed by myself and many others, are as follows:

1. A cessation of the menses, and associated with this (a), a decrease in the size of the myomas; (b) a decrease or cessation of the hemorrhage associated with myomas, whether it be menstrual or intermenstrual; (c) a disappearance of the pains associated with myomas; (d) a cessation of preclimacteric hemorrhages or pains, whether due to myomas or not; (e) sterilization when indicated.

2. The obliteration of postclimacteric hemorrhage.

3. Disappearance or healing of myomas unassociated with bleeding, such as occurs after the menopause.

4. The control of menstrual disturbances at any age, at times without sterilization and, when necessary, with sterilization.

INDICATIONS AND CONTRA-INDICATIONS

The treatment of uterine hemorrhage by means of the Roentgen rays really consists in the treatment of the causes of the hemorrhage, and, I believe, of first importance, is a careful diagnosis made by a competent gynecologist or by one who is capable of making an accurate diagnosis. There is still some difference of opinion as to the indications and contra-indications for treatment. Those who are most skilful, and who have had most experience, are generally most enthusiastic. As a result their indications cover a wider field, and the contra-indications are fewer.

Indications in Hemorrhages Due to Myomas.—1. All cases of myoma in older women in whom there is already a well-advanced anemia, which may be the cause of an anemic heart. 2. All elderly and young women with myomas, in whom there is marked organic heart-disease, diabetes mellitus, chronic nephritis, marked lung-disease and goiter with cardiac symptoms. 3. All patients beyond the age of 40, in whom there is no contra-indication to the treatment. In general, the older the patient, and the nearer she has approached the menopause, the more prompt and satisfactory will be the result. Under 40, roentgenotherapy is not the method of choice, but good results can be obtained, though the younger the patient, the more treatment will be required. 4. The intramural, or the interstitial variety of tumor gives the best results.

Contra-Indications.—1. All cases of myomas in which the tumor is pedunculated, or which can be excised without destroying the reproductive powers of the patient. 2. Fibroids that have undergone malignant degeneration, or that have become gangrenous, should not be treated. 3. Fibroids associated with disease of the adnexa. 4. Fibromas which are producing such marked symptoms that the patient is endangered more by waiting two or three months for results of roentgenotherapy, than by the result of an operation.

RESULTS TO BE EXPECTED IN THE TREATMENT OF FIBROIDS

The decrease, or cessation of the hemorrhage, is the first result to be expected. The effect is more

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6. Halberstaedter: Die Einwirkung der Röntgenstrahlen auf Ovarien, Berl. klin. Wchnschr., 1905, No. 1.

7. Heineke: Ueber die Einwirkung der Röntgenstrahlen auf Tierische Organe, München. Wchnschr., 1904, No. 18.

8. Saretzky: Du Ovarie hervorgerufene Amenorrhoe, Ref. St. Petersburg, Nov. 20, 1908, p. 42.

prompt the older the patient, or the nearer the menopause has been reached. Generally there is a decrease or cessation of the flow within a month or two after the first two series of the application of the rays. At times, after the first series of treatments, there may be an increase in the hemorrhage; in fact, the two subsequent menstrual periods may at times be increased. Generally, the first menstrual period following the first series of irradiations is not decreased and is at times increased. The second period, which usually follows the second series of irradiations, is usually diminished and the third menstrual period commonly disappears. The increase in hemorrhage following the first series of irradiations, is due to the stimulating effect of the rays on the cells. Following this the vitality of the cells is depressed, and finally destroyed. Increase in hemorrhage is more often observed with the subserous variety of fibroids, and in patients who are very anemic. Therefore, when one begins treatment in this class, there should be a special effort made to place the patient in bed following the treatment, and the attending physician should be prepared, if necessary, to tampon the vagina. In none that I have treated has this been necessary.

In patients beyond the age of 40, there are usually required from three to six series of irradiations given in from three to five months. The number of series will depend somewhat on the number of doses, or amount of treatment, given in each series. In patients under 40, considerably more treatment will be needed than in the older patients, and at times it seems only possible to stop the intermenstrual flow, and restore the menses to a normal quantity. At times the cessation of hemorrhage is almost miraculous. In one patient, the bleeding, which had been constant, stopped after the application of one full dose. With the establishment of permanent amenorrhea or an artificial menopause, the patient is likely to have the same group of symptoms which occur with a normal menopause. They are more likely to occur if the menopause has been produced rapidly. In my cases only three patients complained of such symptoms as flashes of heat, a dull headache and restlessness.

With the cessation of hemorrhage, the general health improves, the patient regains color, weight, strength and appetite; sleep improves and the hemoglobin and red corpuscles increase to nearly normal. Albers-Schonberg urges most strongly that each patient have a record made, at the beginning of treatment, of the amount of hemoglobin and the weight. Both the hemoglobin and the weight should be recorded repeatedly during the course of treatment, for if there is no increase in the weight and hemoglobin, he thinks we are justified in understanding that the case is not purely one of myoma, but should always make one suspicious of a malignant disease. One must, of course, bear in mind that other conditions than that of malignancy may be the cause of loss of weight, and it is only when one cannot account for the loss of weight by any other means, that it should be attributed to a possible malignancy.

The tumor is usually the last to show any effect. Occasionally it decreases in size before the bleeding ceases. Generally there is a decided reduction in the size of the tumor at the time of cessation of treatment, and the reduction continues from this time forward. For instance, if the tumor extends to the umbilicus at the time of beginning of treatment, at the end it may be the size of an orange. The tumor continues to

decrease in size long after the cessation of treatment. In one case, the tumor originally extended to the umbilicus. At the end of two years it was the size of an orange, and at the end of five years had disappeared. In another case, the tumor originally extended to the umbilicus. At the end of two years it was very much reduced, and at the end of four years it could not be found. In 75 per cent. of my patients who have ceased treatment, the tumor has disappeared. With a decrease in the size of the tumor, the pressure symptoms disappear.

The question of malignant degeneration subsequent to this treatment, has been raised. No such case has been observed.

The relief of pain will depend in great part on its cause. If it is caused by pressure of a large fibroid, the pain, of course, will not be greatly relieved until there is sufficient reduction in the size of the tumor to release the pressure. If the pain is due to hypersensitive ovaries or ovarian excitability, it will be relieved comparatively early, because the earliest effect of the rays is shown on the ovaries. Such conditions sometimes exist in dysmenorrhea. The relief of pressure symptoms, such as constipation, swelling of the lower extremities, irritability of the bladder, etc., will, of course, await the reduction of the size of the tumor, and, since this is the latest effect to be seen, it may persist for several months after beginning treatment.

HEMORRHAGES DUE TO MALIGNANT DISEASE

Some good results have been recorded from the treatment of malignant disease of the uterus. I began the treatment of malignant disease of the uterus thirteen years ago. In the first patient I apparently obtained brilliant results, with complete disappearance of the disease, which at the beginning was an ulcerating mass filling the entire pelvis, hopelessly inoperable. The patient returned to the hospital one year later for the treatment of a severe Roentgen dermatitis, or degeneration. At this time there was no evidence of malignant disease in the pelvis.

Following this I treated, in all, fifteen cases. All were inoperable or recurrent. In all I got some reduction in the hemorrhage and some improvement in the general symptoms, but, in the end, all the cases but the first case were failures. During the subsequent eight years I then refused to treat such cases, but during the past six months I have taken new courage and enthusiasm from the general results obtained in deep roentgenotherapy.

I have under treatment now, five recurrent cases, following hysterectomy. In all there has been some improvement, some reduction or disappearance of the bloody discharge, relief from pain and improvement in the general health. One seems to have gotten well. In one other case there was no improvement, and the patient died about six weeks after the first and only series of treatments, from ulceration into the bowel. The attending physician believed that this was only the natural course of the disease and not due to the treatment, for there was no damage to the skin.

At the International Congress at London, 1913, Kroenig referred to ninety-six cases of carcinoma of the uterus which had been treated with radium and Roentgen rays, radium being used for the local effect and the Roentgen rays used over the abdomen for the general effect. In forty-six cases of these, the lesions were healed. The longest period of healing, however, had only been one and one-half years.

A review of the twenty-one cases treated by Albers-Schonberg (reported at the International Congress at London, 1913), shows encouraging results, but he feels that several years must pass before we can draw any accurate conclusions.

In general, while we now have some encouragement in the treatment of malignant disease of the uterus, it is not sufficient to justify us in recommending it to replace operation. We should, therefore, urge immediate operation in all cases in which the diagnosis is made while in an operable stage.

For the present we should only recommend roentgenotherapy in the inoperable and recurrent cases. While such cases are correspondingly more difficult, and, therefore, our statistics equally poor, we can hope to do some good in all, and each patient that recovers is just one more saved from the grave. It is to be hoped, however, that such patients will be referred immediately and not allowed to progress for months, and then in the terminal stage sent with the hope that a miracle can be performed.

I believe, too, that the results that have been obtained in the treatment of deep-seated malignant disease justify the surgeon in recommending post-operative roentgenotherapy in all cases operated on. This treatment should be given as soon as the patient can be safely removed to the laboratory. It should be given vigorously, but carefully and skilfully. The possession of Roentgen apparatus is no more a guarantee of skill in roentgenology than is the possession of surgical instruments a guarantee of skill in surgery.

METROPATHIC HEMORRHAGE

Under this heading Eymer and Menge include the following:

1. Cases of bleeding connected with disease of the uterus in which there is no tumor or none recognizable, cases of so-called "metritis."
2. Cases of hemorrhagic endometritis.
3. Climacteric hemorrhages, which are not malignant in origin. In this class of cases deep roentgenotherapy has accomplished good results, and is especially indicated.

Roentgenotherapy has also accomplished good results in some cases of hemorrhage connected with inflammatory disease of the adnexa (Menge), and is indicated in those cases in which operation is contra-indicated for some reason or other.

TECHNIC

In general, the object of the treatment is (1) to depress or obliterate the functions of the ovaries, thus producing an amenorrhea or oligomenorrhea; and (2) to cause an atrophy of fibroids, if present, (a) by action on the ovaries; (b) by direct action on the tumor; (3) to cause degeneration of the carcinoma cells, which should be replaced by healthy connective tissue; and (4) to restore the bleeding mucous membrane in the metropathic cases, to a normal or healthy condition. This should be accomplished without damage to the skin, the bowels or the lymphatic glands, with a fair degree of certainty and within a reasonably short time. Therefore, the greatest attention must be given to technic. To learn this technic, one must learn the principles of roentgenography, as well as roentgenotherapy. This technic is not easily learned, or more men would know it.

The exciting instrument should give a uniform current of high voltage, and sufficient in quantity to excite

any given tube to a high degree of efficiency. Previous to the development of the Coolidge tube, I preferred the high-power, high-speed static machine, 40 plates. Since the development of this new tube, which marks a wonderful advance in roentgenotherapy, I prefer the transformer type of inductor having a rhythmur attachment, which I believe gives the greatest degree of efficiency, and enables one to give a dose in the shortest period of time. In using this very powerful type of equipment, however, special skill is necessary or harm will result. In general, any type of exciting apparatus can be used if the proper balance is maintained between the amount of current used and the proper degree of penetration of the rays from the tube, with a corresponding duration of the treatment. Therefore, the induction coil, transformer type of inductor or the static machine can be successfully used.

The tube should be one that will keep a constant high vacuum of from 7 to 8 Benoist. If the tube is allowed to get soft, the rays will be absorbed in the superficial tissues, resulting in a burn, and the deep effect on the ovaries will not be obtained. Since the development of the Coolidge tube and one or two other recent types, it is possible to adjust the degree of vacuum at will and maintain it uniformly, at the same time using a large quantity of current.

The most practical distance of the target of the tube from the skin of the patient, with our present type of holder and present shape of tubes I have found to be 8 inches. Later, I think we shall develop apparatus which will permit us to get nearer and so to get a greater quantity and more divergence of the rays, which will pass through the small area of skin.

The field of application of the rays is over the diseased area, and in the case of fibroids should be especially directed toward the ovaries, and include the fibroid from every possible direction. The rays should be confined to the area treated as much as possible. If a rapid result is desired, large doses must be given, and since one must not exceed the tolerance of the skin over any particular area, the field of application must be subdivided in such a manner that, by cross-firing an increased dose will reach the deep tissues without affecting the skin. It is this subdivision of the skin-area which has permitted the large doses especially referred to by Gauss and Lembcke and usually spoken of as the Freiburg technic, in which they aim to give all the treatment necessary at one time. This is the other extreme of the swing of the pendulum, as compared with the often repeated, very small doses which were first used by myself and others. It has, however, landed the more conservative man into the middle-road technic, which consists in giving full doses through a number of fields at one time rather than often repeated small doses through the entire lower abdomen, scattered over a long period.

The Freiburg technic is very often spoken of in contradistinction to the Hamburg, or Albers-Schonberg technic. It must not be forgotten, however, that all the prominent roentgenologists are progressive, and what was referred to as the Hamburg or Freiburg technic a year or two ago, is not referred to as the Hamburg or Freiburg technic of to-day. The leaders of both these centers have come closer to a middle course. Albers-Schonberg, like the rest of us to-day, divides the area into a number of subdivisions, and the leaders in Freiburg are making much fewer subdivisions. At present I am guided by the size of the abdo-

men, the depth of the tissues to be treated and the extent and the nature of the disease. For instance, if I am treating a small fibroid which is entirely in the pelvis and is in a thin patient, the subdivisions and fields for the entrance of the rays can be at a minimum, and good results can be obtained by giving a series of treatments through three fields anteriorly and one field in the perineal region. On the other hand, if the fibroid is large and the abdomen thick, I commonly divide the area into twenty-five or more doses, and in carcinoma of the abdomen I at times treat through thirty-five or forty subdivisions, giving the limit of skin tolerance through each area. So, too, when one is dealing with malignant disease or when one is very anxious to produce very rapid results, the quantity of treatment given in any particular series must be correspondingly increased, and, in order to increase this total dosage, the number of points of entrance of the rays must be correspondingly increased. Generally, in the treatment of fibroids, I believe it is not desirable to bring on a very rapid menopause, for by producing this change gradually, there is given an opportunity for the system to accommodate itself to the change.

Albers-Schonberg⁹ has expressed very well the present guiding principles that should govern us in the quantity of treatment, in saying that only such a quantity of rays should be applied as is necessary to produce a satisfactory result, uninfluenced by the duration of the treatment. One can readily see, therefore, that in principle, his ideas are similar to mine—that careful judgment should govern us in each particular case, and that a general rule is no more applicable to all cases in this treatment than is a general rule applicable for an operation to suit all cases.

The time required to give any particular series of treatment will depend on the character of equipment and the technic of the individual operator, as well as on the condition and circumstances of the patient. Generally I use one, two or three days to give any series of treatments, depending chiefly on the number of doses that have to be given in a series. The total dose given in any series varies from 40 to about 800 X. The interval between any series of treatments should not be less than two weeks, and I believe more safely, not less than three weeks.

In one case, in which the malignant disease had matted together all the abdominal viscera, as found by an exploratory operation, I repeated the treatment in two weeks, and in several areas obtained a severe dermatitis. Fortunately, however, these skin ulcerations are practically healed, and the malignant disease in the abdomen, so far as I can tell, has disappeared.

The favorable time for treatment is immediately after a menstrual period. When one has a choice in the matter, the treatment should at least be given ten days before the beginning of the succeeding period. If the bleeding is continuous, the treatment should be given just after the time that would correspond to a period. The skin dose, or total quantity of rays applied to the surface should be carefully measured so as to avoid burns.

A dose refers to the amount of rays that the skin will tolerate without producing more than a slight erythema. This dose, measured by the Kienbock quantimeter, is referred to as 10 X. Measured by the Sabouraud and Noire pastiles or disks, it is recognized as Tint B; or, measured by the Holzknecht radiometer,

it would correspond to 10 units. As referred to in the general literature, the units 10 X (Kienbock) or 5 H. (Holzknecht) correspond to an erythema dose, given without filtration. With filtration, this dose, when measured under 3 mm. of aluminum, can be increased to from 20 to 30 X. To do this, however, one must have a tube that is giving uniform rays.

Filters should be used to cut off the rays that are mostly absorbed by the skin. For this purpose the leather filter, first recommended by myself,¹⁰ has served well. On top of this I now add for this deep roentgenotherapy, 3 mm. of aluminum, and I place these just above the diaphragm of the tube stand.

At present I am giving a dose of 30 X through each area treated. I am not prepared to recommend this extremely high dosage for general use, and would like to add a word of caution to anyone who has not thoroughly mastered his own technic. Therefore, when I treat a case through four fields, it means that the patient is getting 120 X. If the patient is treated through 30 fields, it means 900 X. In this connection I would like to add what Albers-Schonberg has already said, that no case should receive more treatment than is necessary to produce permanent results, and without regard to the speed with which these results are to be obtained. In the treatment of malignant disease, one must use enormous doses to accomplish results.

Skin effects, in the hands of skilful operators, have been of almost no consequence. In a number of patients treated an erythema developed, and in others the skin became pigmented or tanned. These effects disappeared, leaving the skin undamaged. In a few cases a dermatitis of the first degree has been produced. In these later cases telangiectases develop in the skin about a year later. In the treatment of malignant disease, skin irritation is of secondary importance, but one should never go beyond the production of a slight erythema.

DISADVANTAGES AND ADVANTAGES OF THE TREATMENT

The disadvantages are the following:

1. The prolonged course of treatment that is usually necessary. This can be somewhat shortened by giving enormous doses through a large number of fields. If by this means the course of treatment is reduced to two or three months, it will probably only equal the time required for operation and convalescence therefrom.

2. There is danger to the overlying tissues, if the rays are not properly applied. By careful attention to the technic and exact measurements of the skin dose, this can be eliminated.

3. It has been claimed to be more expensive than operation. In a sense this is true. If one considers, however, that by this treatment the expense of board and hospital care is eliminated, both in the case of charity and private patients, and that in both instances they can go about their usual duties, I believe we must conclude that it is not more expensive.

The advantages are:

1. It is painless.
2. It avoids the shock of an operation.
3. It preserves to a certain extent, we believe, the internal secretion which is lost in a complete oophorectomy.
4. It does not interrupt the usual habits.
5. Confinement in a hospital is avoided.

9. Albers-Schonberg: Tr. Sect. Radiology, Seventeenth Internat. Cong. of Med., London, 1913.

10. Pfahler, George E.: Tr. Am. Roentgen-Ray Soc., September, 1905.

6. In the hands of a skilful operator it is without risk.

7. The menopause is brought on gradually, when necessary.

8. The amount of treatment can be graded to the needs of the patient.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRs. NOVAK, KELLY AND PFAHLER

DR. CHARLES C. NORRIS, Philadelphia: As I view the subject it is largely one of the study of etiology—in other words, to treat uterine hemorrhage intelligently we must be cognizant of its cause. Uterine hemorrhage is a symptom and not a disease, and no rule of thumb can be successfully employed in its treatment. If any criticism whatever can be applied to the excellent papers comprising this symposium, it is that this point has not been sufficiently dwelt on. Each case must be studied and treated individually. Some of the chief causes of hemorrhage are myomas and carcinoma of the uterus, endometrial polyps, hypertrophic thickening of the endometrium, displacements, adnexitis, ovarian neoplasm, disturbances of the functions of the various ductless glands, especially the ovary, certain constitutional diseases, especially syphilis, tuberculosis, hemophilia, chronic liver and heart, kidney and lung disease, besides other less frequent conditions. When we consider the great number of diseases which may cause hemorrhage, the importance of accurate diagnosis is apparent. As an example of this I may cite a case in which I was recently asked to perform a curettage for hemorrhage on a patient suffering from syphilis. The pelvic examination was negative and the exhibition of neosalvarsan checked the hemorrhage very quickly. A curettage in this case would have been of no benefit. The constitutional disease was what required treatment. The treatment of myomas of the uterus with radium or Roentgen rays undoubtedly has a very definite place in gynecology. No one however skeptical can fail to be convinced by the excellent results reported by Drs. Kelly and Pfahler, as well as those by Krönig and Gauss and others. Personally, however, I doubt very much if the Roentgen rays or radium will ever supersede surgery in the routine treatment of uterine myomas. The extremely small operative mortality and the excellent postoperative results are strong arguments in favor of the surgical treatment, whereas the prolonged treatment required and the expense, as well as the somewhat less certain results, are points that must be considered before Roentgen-ray or radium treatment is selected. Another important point of practical value is that carcinoma of the fundus is occasionally and indeed relatively frequently an accompaniment of myoma of the uterus. In all patients suffering from hemorrhage at or near the cancer age it is our first duty to exclude carcinoma, and this is particularly true in those cases in which the pelvic examination is negative or reveals only a slightly enlarged uterus. Dr. Kelly, you will remember, has very properly performed a curettage for the purpose of determining this point as a preliminary step before instigating the radium treatment. In closing I would again urge the necessity of studying the etiology of each individual case, for only by so doing can the proper treatment be instigated.

DR. JOHN A. MCGLINN, Philadelphia: So far as the nervous element of the bleeding from the uterus is concerned, it is not so much due to shock to the nervous system as it is to the result of the shock on some of the ductless glands. In the few cases following shock I have noticed other metabolic changes, such as falling of the hair and change in menstrual bleeding. Some time ago I sent out a letter to the members of the American Surgical Society asking whether in their opinion surgery could be eliminated in the treatment of fibroid tumors of the uterus. Eighty replied that positively it could not be. The same question was asked the Roentgenologists and eight out of 90 replied that it could be and that the Roentgen ray should take the place of surgery. I feel that we should not confuse the cure of fibroid tumors of the uterus with the relief of bleeding from fibroid tumors of

the uterus. I have no quarrel with radium or with the Roentgen ray, but that surgery can be eliminated in the treatment of fibroid of the uterus I do not believe. I believe that even with the Roentgen ray and radium, surgery is still the best treatment. The mortality of surgery in these cases is due to the various complications present other than sarcomatous degeneration; so that, considering the mortality, it will be found that the Roentgen-ray treatment has not a great advantage over surgery, taking into consideration the ultimate cure. The reports given by Dr. Kelly are amazing. According to the reports gathered in the clinics in Europe, but 5 per cent. of the tumors entirely disappeared. That simply means that 95 per cent. of these tumors are in a condition to undergo complications which will bring the high operative mortality; whereas, if the cases were treated by surgery, even if 5 per cent. of the patients do die, at least 95 per cent. of the cases are cured against 5 per cent. cured by the Roentgen ray.

DR. WILLIAM S. NEWCOMET, Philadelphia: I am glad to know that when Dr. McGlinn sent out that little note, only eight out of one hundred roentgenologists decided that all tumors could be treated by the Roentgen ray. As a rule I think that roentgenologists try to be conservative, and this proportion shows well for our work. The work of Dr. Kelly and Dr. Pfahler shows that under these good reports was skill. No doubt the great trouble often in the matter of results is that many patients are treated by persons who do not understand how to use these methods. Furthermore, I am glad also to hear Dr. Kelly mention the fact that the Roentgen ray and the gamma ray are not to be regarded the same. It was twice stated in this meeting by men in other Sections that the Roentgen ray and the gamma ray are identical and that they can be used one for the other. Any one who has ever had any experience with the Roentgen ray and with radium and has seen the reaction from each, must be impressed with the entirely different process following the application of either of these methods. Also if you should have a burn or a reaction from the Roentgen ray in the same proportion as you have a reaction or burn from radium you would have a lifetime injury; whereas the reaction from radium will clear up in a very short time. It is a curious thing that abscess follows the destruction of tissue in these cases from radium. Dr. Kelly has referred to this, and I have seen it twice in my own experience. On the other hand, it is very rare to have abscess follow destruction of tissue from a Roentgen-ray burn. Dr. Kelly's results exceed any I have seen so far published. They far exceed those of the London Radium Institute, which I am in the habit of quoting because I think they are given from a very conservative basis. Another important point taken from Dr. Kelly is that his applications are directly on the tumor, while in the vast majority of cases treated by the Roentgen ray, the influence on the fibroid is from the reaction on the ovary. Curiously enough, it has been cited time and time again that in these pelvic cases treated by the Roentgen ray sterility usually follows. About ten years ago I treated for Dr. George Erety Shoemaker a patient with a large sarcoma of the pelvis about the size of a seven months' pregnant uterus. The woman recovered and became pregnant twice, the first pregnancy occurring two years after the disappearance of the tumor. The woman is now in good health.

DR. STEPHEN E. TRACY, Philadelphia: Before we can intelligently treat a case of uterine bleeding it is necessary to make a diagnosis, and this is not always possible before operation. I cannot speak of radium, as I have had no experience with it, but I want to congratulate Dr. Kelly on the wonderful results. There are those who assert that all cases of carcinoma of the uterus and all fibromyomas of the uterus should be treated by roentgenotherapy, and I trust that Dr. Kelly in closing the discussion will state his position in this matter. Dr. Pfahler has designated what cases of uterine bleeding are suitable for roentgenotherapy, and I believe that most of us will agree largely with his statements. We all know that Roentgen-ray treatment for malignant disease of the female pelvic organs has been practically worthless. In regard to fibromyomas of the uterus, it is well known that malignancy is present in from 4 to 5 per cent. of the cases. Malignancy and the

various other degenerations of fibromyomas of the uterus are found in 15 per cent. of the cases which come to operation, and such cases are not suitable for roentgenotherapy. When we add to this 15 per cent. the complications and associated conditions in the appendages, we have in between 30 and 35 per cent. of the cases conditions which would not be cured by roentgenotherapy. At least 25 per cent. of the women with fibromyomas of the uterus who have come to operation, would have perished, sooner or later, if they had been relegated to the roentgenologist. It is generally conceded that women under the age of 40 years are not good subjects for Roentgen-ray treatment. It has been clearly shown that after the age of 40 years the dangers of fibromyomas of the uterus increase with advancing years. In a collected series of approximately 700 cases I found that 70 per cent. of the degenerations took place in women after the age of 40 years, and that over 90 per cent. of the malignancies were found after that age. When all these facts are considered, the conclusion is inevitable that the best treatment for the majority of these tumors which produce symptoms is early surgical intervention, unless Dr. Kelly can cure them all for us with radium.

DR. CURTIS F. BURNAM, Baltimore: I have been studying with Dr. Kelly the cases reported. I have seen them from the very beginning and therefore have taken a very lively interest in the foregoing papers and the discussions. I incline to believe that many cases of uterine hemorrhage are really dependent on uterine and not ovarian conditions. This view is partly substantiated by a series of cases in which I operated on young girls for hemorrhage; curettage having failed to relieve them, resection of the ovaries was finally resorted to. In spite of the reduction of the ovaries the bleeding continued. In one of the group intra-uterine application of radium brought about a return to normal menstruation after operation had failed. An interesting point in connection with all these cases is the frequent absence of menopausal symptoms when complete amenorrhea has been produced by the treatment. It is quite astonishing to interview a patient who gives no history of menstrual or other bleeding and yet reports not the slightest general disturbance. Proceeding to the therapeutic questions involved in these cases, I should like to be put on record with Dr. Kelly in asserting definitely that the ray treatment will perhaps entirely replace operative surgery and will certainly do it in most cases. The treatment itself is extremely simple, without danger, is not time-consuming, and in no way prevents going on later to surgical methods if it proves unsuccessful in any given case. I should like also to say in reply to one of the speakers, that the recent reports from Freiburg of mesothorium treatment in similar conditions in every way conformed to these results here reported. Gauss and Lempke state that in sixteen fibroids radiated, fifteen have entirely disappeared and one greatly decreased. I should like also to emphasize that the effects of radiation in uterine fibroids, as also in polypoid endometritis, and perhaps also in cases of metrorrhagia hemorrhagica should be on the tumor and uterus and not on the ovaries. So far as I know no one has treated a large fibroid tumor of the uterus in which the growth disappeared within a few months after radiation and the patient continued with normal menstruation up till the cases which we report. The efforts of most European roentgenologists have been directed toward devising technic to radiate the ovaries. It has been assumed that the effect on the fibroid is indirectly through the ovaries, although many have stated that there may be an effect on the tumor itself. Our plan is to protect the ovaries and radiate the tumor. Under radiation the tumor disappears rapidly; from ovarian ablation the disappearance is slow, extending over months and years. Radium has the advantage over the Roentgen ray because it is applied inside the uterus, affects directly the tumor and to a lesser degree the ovaries. It would seem easily possible, however, to devise a technic for the Roentgen ray which will radiate the uterus and not the ovaries. I am far from saying that in a very short time results as rapid and complete cannot be gained by the Roentgen ray as well as by the radium. In polypoid endometrium amenorrhea cases cessation of bleeding was brought about immediately from the day of the treatment.

DR. GEORGE ERETY-SHOEMAKER, Philadelphia: I have a word to say on the subject of any treatment which leaves the tumor in the pelvis, when there is a tumor. The complications are often more important than the tumor and bleeding is the only one of them which may be modified by the Roentgen ray. Dr. Pfahler in his interesting paper mentioned that the question of malignant degeneration had been raised but that no case had been reported. I had the experience two months ago of operating in a case to be later more fully reported which had been under Roentgen treatment by a competent operator for fibroid tumor, but which later developed sarcoma. The whole treatment by other means than hysterectomy went through seven years, first, for a year by the active electrical treatment which we no longer hear about. Then the patient had Roentgen treatment twice a week for many months and the hemorrhage stopped, as it does in some fibroid cases. She still shows purplish spots in the skin over the abdomen, due to the Roentgen ray. After five years of cessation, her tumor increased in size, she began to bleed again, and her physician, Dr. Evans, sent her to me for hysterectomy. She had a fibroid tumor of the uterus with sarcomatous degeneration scattered in various parts through it. After years of treatment she had to have the operation after all. In Dr. Kelly's series of polypoid endometritis case there is one confusing element. He says he curetted each one before the application of radium. Of course the curet alone will in good hands stop the hemorrhage in a certain number of cases. According to his table some of the patients had not previously been curetted.

DR. GEORGE C. JOHNSTON, Pittsburgh: Dr. Kelly states that he has taken the opportunity to bring this matter before the general profession through the medium of this meeting and through the medical press. In regard to the Roentgen-ray treatment of fibromas, I am surprised at the attitude taken by some of the profession. We roentgenologists do not wait to treat these cases. Our position is this: we are engaged in our work, and in walks a prominent gynecologist. He says "Don't you see what they are doing over in Freiburg?" We perfect our technic and devote ourselves to this work and then we are blamed for taking these cases. We do not want them but if you men will not take them, we shall be obliged to. We will treat only those cases that are referred to us by competent gynecologists who say that in their opinion these cases are better treated at the hands of a competent roentgenologist than by the surgeon.

DR. EMIL NOVAK, Baltimore: In the present state of our knowledge it is unwise to be dogmatic as to the relative importance of the uterus and ovary in the causation of functional uterine hemorrhage. Even though it be shown that uterine bleeding is caused by a local factor in the endometrium, it seems probable that the presence of this factor is in some way due to the activity of the ovary. The assumption that there is a local physiologic disturbance in the endometrium would seem to explain why curettage will sometimes relieve uterine bleeding, even though the removed endometrium is microscopically normal. In these cases it is unlikely that the cessation of the bleeding is due to the removal of the accumulated coagulation-inhibiting substance in the endometrium. As I stated in my paper, anatomical changes in the endometrium are often, no doubt, the result rather than the cause of menstrual aberrations. We must learn to look on the endometrium as a sensitive plate which registers the more fundamental phenomena of menstruation. Certain histologic changes are now recognized as characteristic of the normal menstrual cycle, and in the same way we must learn to appreciate that various histologic pictures, abnormal as to degree or time of appearance, may be encountered when menstruation is abnormal.

DR. JOHN M. FISHER: I want to ask Dr. Kelly whether the fibroid tumors were selected cases?

DR. HOWARD A. KELLY, Baltimore: The fibroid tumors were not selected in this series. If I had any extensive abscesses or cancer of the body complicating the fibroid I would not use the radium, but would take any other case that came along. In hemorrhage cases and the fibroids with or without hemorrhage, the first thought is radium and not operation.

ation. Curettage was done at the time the patients were treated. Many of them had been curetted previously but unsuccessfully, or they would not have come into our hands for treatment for the hemorrhage. It is an entire innovation in our methods and in the matter of the benefit of the patient. The operative cures of sarcomas of the uterus are practically nil. In about 400 cases treated with radium and Roentgen rays in Freiburg there is no case on record with history of subsequent development of malignancy. In illustration as to the effect in sarcomas: A tall overgrown lad with a big tumor in the left abdomen comes for treatment. After treatment for several months, on examination nothing could be felt through the abdomen but a small mass through the rectum. Dr. Burnam took that out and it was found to be a testicle which had become sarcomatous. On the other side there were two fallopian tubes and a little uterus in between. In other words, it was a case of mixed sex elements. Something new has come into our midst and something big. We must take hold of it and see what comes of it. We are using radium every day for uterine hemorrhage, for fibroid uteri. We have radiated many carcinomas of the cervix uteri. In some cases we have later removed the uterus. In not one have we discovered any cancerous elements remaining. In one of them we found some of the pelvic lymphatic glands infected. In one case we found the glands enlarged at the operation. We have a very definite hope that we can follow these cases in a considerable series. A number of cases come to us with other ailments, such as Bright's disease, diabetes and carcinoma of the uterus, which cannot be operated on. Some have profound anemia; others tuberculosis. To all these cases radium comes as a great boon, which is going to be extended and which we hope to develop in this class of cases. It does not take such a large amount of radium that the slender pocketbook cannot afford it.

DR. GEORGE E. PFAHLER, Philadelphia: I want only to answer one or two points, one with reference to the disappearance of the tumor. I said that 75 per cent. of the tumors I had treated had disappeared, and so they have, and you must not forget that these quotations made by Dr. McGlinn are mostly based on the work of men of few years of experience. They have treated more cases than I have. The roentgenologists have been working for from eight to ten years, and that is the reason we can speak with a little greater emphasis than these men can, because the tumor continues to disappear long after the treatment has stopped. With reference to degeneration of the tumor, I inquired of the physician who treated the patient referred to by Dr. Shoemaker. The patient came weekly for treatment through the years when the treatment was much less developed than at present. He referred the patient for operation. Regarding degeneration of these tumors, it has been stated by men who know that 5 per cent. undergo malignant degeneration. If this is true, why have not 5 per cent. of those treated undergone degeneration? And if they have, do you believe that the physicians of this country have so neglected their duty that they will not call the attention of the profession to the fact that these tumors undergo degeneration later? Until we have definite data we have no right to assume that these tumors will undergo subsequent degeneration.

Insects and Disease.—When the history of medicine during the past quarter of a century comes to be written, the one outstanding feature of the period will be shown to be "the part played by insects in the spread of disease," and the application of this knowledge as a practical hygienic factor. Vermin have been "detested, shunned by saint and sinner," since the creation of man, but the reason for the abhorrence has only been proved of late years. That the mosquito can carry malaria, yellow fever and filaria; and that the bedbug, the louse, the flea, the fly, the blackbeetle, the tick, the itch insect and other vermin are agents in the transmission of a given disease is now common knowledge. This information has placed the subject of domestic and public hygiene and sanitary endeavor on a sure foundation, and given a stability to preventive measures hitherto unattainable.—*Jour. Trop. Med. and Hyg.*, April 15, 1914.

AN UNUSUAL CASE OF BROMODERMA OF THE LEG*

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Of the three halogen elements which play such a great rôle in the household of nature, bromin, discovered by Bayard in 1826, is the youngest. The others are iodine, discovered by Schele in 1774, and chlorine by Curtois, in 1812. English and French physicians were the first to use bromin and to study its action.¹ In Germany Otto Graf (1840) emphasized its sedative and depressant action on the nerve-centers. But it remained for Sir Charles Locock to introduce it in 1851, and to acquaint the profession with its main therapeutic virtues. Its position at present is that of a neuromuscular depressant and as such its main use, logically, is directed against the best-known of all convulsive diseases, epilepsy. Inasmuch as in potassium bromid the acid bromin, as well as the base potassium, has a sedative active on the nerve-centers and on the muscles, the salt is eminently fitted to cope with the explosive attacks of epileptic convulsions and hence is the most widely used of the numerous bromid compounds. It is excreted by the kidneys more rapidly than other compounds because of double decomposition in the blood, with the formation of potassium chlorid, which acts as a diuretic and increases the chlorine excretion through the kidneys. While small doses administered for a long period cause blunting of the sensory nerves, impairment of motor and diminution of reflex activity, continued large doses will cause the more pronounced depressive attacks known as bromism.



Fig. 1.—Bromoderma of leg; showing a slightly scalloped border with a few partly healed ulcerations. Lower border ends abruptly in a semi-circular line. Quiescent stage. No active symptoms at present. Leg shows smooth atrophic surface with thin easily detachable scales.

Although, as shown by Kross,² Albertini,³ Nencki,⁴ Fell,⁵ Hoppe,⁶ and especially by von Wyss,⁷ Ellinger⁸ and others, in chronic bromid intoxication the central nervous system has to bear the main brunt of attack, yet the symptoms of bromism are not due to a surcharge by it of these centers, but rather of the blood. It replaces with avidity the chlorine content of the blood and the gastric juice and is found in the secretory and excretory organs.⁹

* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Sharp: *Pharm. Jour.*, 1911, xxxiii, 128.
2. Kross: *Arch. f. exper. Path. u. Pharmacol.*, 1876, v, 6.
3. Albertini: *Arch. f. exper. Path. u. Pharmacol.*, 1882, xv, 248.
4. Nencki: *Arch. f. exper. Path. u. Pharmacol.*, 1893, xxxiv, 313.
5. Fell: *Inaug. Diss. Wurzburg*, 1899.
6. Hoppe: *Neurol. Centralbl.*, 1906, xlv, 266; *ibid.*, 1908, xlv, 186.
7. Von Wyss: *Arch. f. exper. Path. u. Pharmacol.*, 1906, xlv, 266.
8. Ellinger: *Arch. f. exper. Path. u. Pharmacol.*, 1911, lxx, 87.
9. Ellinger: *Med. klin.*, 1910, No. 38.

It has been shown that those organs richest in chlorin contain the greatest amount of bromin, hence blood-serum contains the greatest amount of it, next in order being mother's milk, tears, saliva and the skin. In a regimen of salt-poor diet in animals Von Wyss has demonstrated that 40 per cent. of the chlorids must be replaced by bromids to cause poisoning, and Hoppe¹⁰ found in the gastric secretions of epileptics one-third of the chlorids replaced by bromids when the bromin influence showed itself. The antagonistic effect of these two elements is remarkable. Bromism is caused by the accumulation of bromid-ions and diminution of chlorid-ions in the blood and in all the other body juices and organs. Both conditions, it seems, are interlocking; it may be the plus of bromin or the minus of chlorin that causes the intoxication. When table-salt is withheld from the diet of epileptics they become more susceptible to the action of bromin, while abundant administration of table-salt causes the bromism to disappear by increased kidney activity.

ETIOLOGY OF DRUG ERUPTIONS

These will be encountered chiefly in epileptics as they are the principal consumers of the bromin compounds. Though almost any drug may cause an eruption, yet, for obvious reasons, those caused by the



Fig. 2.—Bromoderma of leg; showing the convex lower border and centrifugal extension of the process downward. Outside aspect of right leg. Also shows some activity yet, as seen in the healing ulceration on the upper border.

iodids and bromids have merited the greatest attention by the profession. The mode of development of these eruptions has hitherto been quite conjectural, but certain observations have brought us nearer to concrete facts, although not to perfect understanding. There are several theories extant concerning the nature and manner of drug eruptions. It is somewhat disappointing that the most natural explanation, the excretion of the "materia peccans" by way of the blood through the glandular system of the skin, is doubted.

Not many facts resting on a solid basis have been adduced to prove modern and fanciful theories. Humoral pathology in modern garb, to which we unconsciously are drifting, offers a plausible explanation. If we substitute the modern toxin for the obsolete "materia peccans" and discard the mysterious "critical sweats and eruptions" by calling them reflex phenomena or vessel changes, then we have a working basis at least approximately serviceable to explain drug eruptions. The general consensus is to call drug eruptions only such phenomena of the skin as follow the ingestion and absorption of certain drugs. Skin lesions produced by the external application of drugs are called artificial dermatitis or dermatitis venenatae.

Their action is due to their irritating properties exerted on the skin, which depend on the strength of the drug; while the drug exanthems *per se* do not generally depend on dosage. Here a predisposition, a so-called idiosyncrasy, must be present, an intolerance, as it were, for the particular drug or food (crabs, strawberries, etc.). But this arbitrary division becomes untenable when we consider that drugs like salicylic acid, antimony, chloral, antipyrin, etc., may cause eruptions when used both internally or externally; while others will not cause eruptions when applied externally, but will when taken internally (strophanthus, rhubarb, etc.). Again, iodoform is taken internally without unfavorable consequences, while externally it causes great irritation in some persons. It is, therefore, impossible to systematize the etiology of drug eruptions. They may be caused in different ways, either through irritation of the skin glands or their vessels in excreting the toxic substance, or through reflex irritation of the vessels.¹¹

On the other hand, external skin irritants like rhus or chrysarobin may cause very intensive constitutional symptoms. The theory of cumulative action, while it fits certain phenomena, does not explain why certain individuals will show a skin eruption very soon after the ingestion of small quantities of a drug which does not harm the great majority of others. Such a predisposition may be a lasting or a temporary one, or one becomes accustomed to skin irritants. With quinin eruptions a hereditary predisposition is observed, while in some instances such abnormal sensitiveness may be acquired and in others become lost. Kaposi¹² thinks that the vasomotor influence cannot hold good in all instances. Some rare cases of urticaria appear as soon as the provoking substance is taken into the mouth. Here the eruption can be explained only by a reflex irritation via the gustatory nerves.

Again the same drug may cause different forms of eruption in different individuals while different drugs will always cause the same form in the same person.¹³ The polymorphism of these drug eruptions is one of the main features distinguishing it from other well-defined inflammatory types which they may simulate, and which are dependent on a functional disturbance of the vasomotor nerves (angioneuroses). For instance, in urticaria *ab ingestis* the toxins generated by the fermentative products from the gastro-intestinal canal act on the vasomotor centers in the same manner as the irritant drug iodine or bromine.

It is, therefore, as stated before, impossible to narrow down all the enunciations of drug exanthems into a system. Neither from the point of view of the drug, nor from that of the different response on the skin is such a generalization possible. We must have recourse to more or less proved theories, namely: an especially vulnerable skin, differences in the anatomic structures or their distribution (vessels, nerves), a peculiar receptivity of the system, deviation from the normal of the position of the skin-glands, secretory and excretory alterations of their functions and many other incidents partly speculative, partly scientifically demonstrable. Predisposition for and idiosyncrasy against a certain drug, food, or external irritant are yet valid as causes but fortunately not the exclusive explanations in this contradictory domain. If I add

11. Passini: Ann. de dermat. et de syph., 1906, vii.

12. Kaposi: Pathologie u. Therap. d. Hautkrankheiten, i, 238.

13. Joseph: Lehrbuch der Haut- und Geschlechtskrankheiten für Aerzte und Studierende, 1892, p. 120.

to these more or less plausible theories that the skin lesions are caused by the drug itself or its metabolic changes directly or by reflex action via the vasomotor or trophic apparatus, we have in a nutshell all that is known of the causation of drug eruptions.¹⁴ Skin eruptions of a kindred type are observed also after adenoid operations, icterus, serum-therapy, etc.; here the trauma, the bile, the decomposed albuminous products are the causative agents of the skin eruptions.

SYMPTOMS, DIAGNOSIS AND PATHOLOGY OF BROMODERMA

The best evidence that drug eruptions are of angioneurotic character, caused by functional disturbances of vasomotor nerves, is the fact that they simulate almost to the point of confusion other well-known exanthems like erythema nodosum, erythema multiforme, urticaria, scarlatiniform eruptions, etc., known to be of angioneurotic origin; that fever and general systemic disturbances are mostly absent or when present appear only in a mild degree. This forms a distinctive point in the diagnosis of a drug eruption. The differentiation from the infectious angioneuroses—acute exanthems,—will not be a difficult task if we take into account their onset, development, and the highly violent systemic disturbances accompanying them.

Iodin and bromin eruptions have some marked peculiarities which differentiate them from other medicinal skin lesions which show a tendency to appear either discrete or generalized. The two have very much in common and, in cases in which the vitiating drug is unknown, they may present some obstacles to a correct diagnosis. There are certain etiologic as well as clinical and histological features, however, which enable us to distinguish the one from the other in most instances.

The average bromin eruption, as is well known, starts with acne-like lesions in places where acne vulgaris usually appears. In its severer types the base of these papulopustules becomes infiltrated and the lesion appears to be raised above the surface. Soon others will appear and a patch of grouped pustular lesions clustered together become confluent in places, occupying a space the size of a silver dollar or larger. This type usually is found on the extremities, with a preference toward the lower one. This agglomeration is characteristic of bromid eruptions. Through proliferation and hyperplastic changes, tuberculous, furuncular, and anthracoid formations develop which soon break down, forming fungating, papillomatous or ulcerated highly colored elevations, appearing as if a sarcoid had broken down. The borders of these elevations carry small, sieve-like perforations, giving it the appearance of a honeycomb, from which a foul-smelling smegma issues. These conglomerate patches soon become covered with greenish adherent crusts occupying large areas of several square inches, favoring the lower part of the leg, as in the case I will describe; or they may appear in discrete patches all over the body. Phlyctenular eruptions of the conjunctiva bulbi, and furuncular lesions of the external auditory canal¹⁵ have also been observed. I have seen painful furuncles of the follicles of the vibrissae of the nostrils, causing an erysipeloid inflammation of

the alae nasi. Comby,¹⁶ Marzianni and others¹⁷ have seen in infants bromodermas acquired through their mother's milk.

The diagnosis of a bromin eruption, if the cause is unknown, may offer considerable difficulty. Diagnosis of the discrete, acne-like or the papulopustular form necessitates the knowledge of quite a goodly number of dermatoses which they resemble. Those which are ushered in as a generalized eruption will naturally make the diagnostician consider the possibility of one of the acute contagious exanthems, but fortunately there are distinguishing points from which one may arrive at a proper diagnosis. Common to all forms is the suddenness of outbreak and in the generalized forms the violence of development, both local and systemic; the brevity of the acute stage, and the relative quickness of defervescence. In the chronic conglomerated, fungating and exulcerating forms occupying at times almost the entire lower extremity, the risk of a faulty diagnosis is imminent, and sometimes fraught with grave danger to the patient.

In the oft-cited case¹⁸ of Köbner, amputation of the leg was avoided only in the nick of time and in his case of a scarlatiniform quinin eruption a prioress was quarantined for suspected scarlet fever for weeks. In Caspari's case,¹⁹ an alleged pemphigus chronicus turned out to be a bullous antipyrin rash. Innumerable other instances of this kind could be cited.

The pathology of bromin eruption is that of a more or less deep inflammation and will vary with the particular form it assumes. Changes in the papillary layer, in the periglandular tissues and the vessels surrounding them, a hyperkeratosis and parakeratosis and minute abscess formation in the corium are its main characteristics. Guttman²⁰ was the first to demonstrate bromin in the pustule and Fox and Gibbes²¹ found



Fig. 3.—Inside aspect of right leg showing the same centrifugal extension as Figure 2. Note smooth atrophic scaly appearance.

that the process starts in the cutis vera in the form of minute abscesses. The coil-glands show changes, but the pilosebaceous glands are slightly and only secondarily involved. Hence they declare that the so-called bromid acne is not a real acne.

While Von Wyss and Ulrich²² consider local intolerance of the skin as the cause of bromid acne, Laudenhimer²³ declares it to be a real symptom of bromin intoxication. According to Gley²⁴ and Cannizarro²⁵

14. Compare Neuman: *Lehrbuch d. Haut Krankheiten*, French translation; Auspitz: *System der Hautkrankheiten*, Vienna, 1881; Crocker: *Brit. Med. Jour.*, 1893, p. 1208; Szadek: *Zur Casuistik des Bromexanthems*, *Arch. f. Dermat. u. Syph.*, 1888, xx, 599; Besnier, Brocq and Jacques: *La Pratique Dermatologique*, ii, 480.

15. Gruber: *Allg. med. Ztg.*, 1887, xli, 409.

16. Comby: *Bromides cutanées chez les nourissons*, *Bull. Soc. de pédiat. de Paris*, 1912, xiv, 153.

17. Marzianni: *Di un bromoderma tuberoso osservato contemporaneamente nella madre e nel bambino lattante*, *Boll. d. Soc. med. di Parma*, 1912, Series 2, v, 53.

18. Köbner: *Arch. f. Dermat. u. Syph.*, 1873, *International Dermat. Cong.*, Vienna, 1892.

19. Caspari: *Zur Lehre von den Arznei-Ausschlägen*, *Arch. f. Derm. u. Syph.*, 1894, v, 26.

20. Guttman: *Virchows Arch. f. path. Anat.*, 1888, lxxiv, No. 4, p. 22.

21. Fox and Gibbes: *Brit. Med. Jour.*, 1885, p. 971.

22. Von Wyss and Ulrich: *Neurol. Centralbl.*, 1910, p. 75.

23. Laudenhimer: *Zur Behandlung und Theorie des Bromismus*, *Neurol. Centralbl.*, 1910, lxxiv, 461.

24. Gley: *Recherches sur le fonction de la glande thyroïde*, *Arch. de physiol. et de path.*, April, 1892.

25. Cannizarro: *Deutsch. med. Wchnschr.*, March 3, 1892.

bromin has a vicarious action on the ganglia almost similar to the active principle of the thyroid gland. Its administration may cause hyperthyroidism.

REPORT OF CASE

History.—A. L., aged 24, of healthy parentage, both parents living, had measles when 1 year old. At the age of 8, she contracted scarlet fever, complicated with kidney trouble and convulsions. After recovery she remained quite well for a year, when the convulsions returned. From this time on she was subject to epileptic fits, against which the use of bromids was advised. One year after the use of the drug—potassium bromid—she had acne of the face and on the border line of the scalp, and soon the right leg became the seat of a papulovesicular eruption. In the beginning discrete, later these lesions through conglomeration became confluent, occupying the middle of the tibial region, and calf of the right leg. Considerable pain and impairment of locomotion was present. One of the peculiarities of the case consists in the strange phenomenon that the eruption becomes aggravated in the fall and winter, and assumes a milder aspect or complete



Fig. 4.—Bromoderma, showing partial obliteration of the papillary paps. Spongiosis and intracellular edema. Dilation of lymph-spaces, moderate cell infiltration.

cessation in the spring. The patient denies a more abundant use of the bromid during the winter months, asserting that, in order to avoid seizures, she uses the drug more frequently during the summer. She had no attacks for seven years. When she stopped taking bromid the attacks returned. The eruption, however, continued when medication was interrupted. For six years she has taken a patent medicine containing bromid and for the last two months she has stopped medication entirely with the result at present of the complete cessation of active skin lesions. When I first saw the patient three years ago, she had on her left leg a patch of aggregated papulopustules, on an infiltrated base about the size of her palm and covered with crusts. On the left upper thigh a fungating ulcer the size of a half-dollar was observable, which developed through the exulceration of several confluent lesions. It was very painful and bled at the slightest touch. This latter symptom will be dwelt on presently. The most interesting change occurred on the right lower limb. Here an inflamed surface presented itself, extending from the upper third of the leg down to both malleoli. The front aspect (Fig. 1) shows a crusty, slightly-scalloped border studded with a few partly healed shallow ulcerations. The lower border ends abruptly in a semicircular concave line at about the crest of the tibia. The part which now presents a smooth

atrophic surface covered with thin cigarette-paper-like easily detachable scales, in the active stage showed an oozing, angry-looking surface, studded with innumerable pin-head- to split-pea-sized discrete and coalescing papulopustules considerably raised above the surface. The border of these papillomatous lesions had a honeycomb or sieve-like appearance from which a smegma-like offensive-smelling substance could be expressed. Some of these anthracoid and necrobiotic ulcerations as a remnant of former activity can yet be seen on the inner and outer border of the leg (Figs. 2 and 3). A most prominent feature, to my knowledge observed only once, though I have searched for it in the literature for the past thirty years, consists in a venous capillary hemorrhage from these ulcerations. At times, usually in the defervescing stage, a lamellous epidermic exfoliation would take place, exposing painful surfaces. Kudisch's case²⁶ resembles mine. It occupied three-quarters of the leg, had a vegetating appearance, bled easily, and had festooned borders. The hemorrhage, however, was not so abundant and there was no such epidermic exfoliation. My patient is not afflicted with hemophilia, has a normal blood-count, no nosebleed, no excessive menstruation and has healthy gums. At first varicose veins were thought of as the cause of this unusual symptom, but they were not found. Microscopic examination of an excised portion, however, revealed very marked dilatation of the blood- and lymph-vessels causing these extensive capillary hemorrhages in the pars papillaris. This finding explained the unusual feature of the lesion, caused by an excessive development of the vascular loops of the papillae, which formed the anatomic basis of the fungating lesion.

Histologic Examination.—By Dr. W. McMurtry of the Pathological Division of the Dermatological Department of the Vanderbilt Clinic.

Epidermis: This shows considerable acanthosis. The interpapillary prolongations are shortened or absent generally. The rete malpighii is slightly edematous in spots and the intercellular spaces contain more than the usual number of leukocytes. In one area only, marked parakeratosis is seen, but elsewhere the stratum granulosum and corneum are approximately normal; the latter shows hyperkeratosis in certain areas although clinically a marked tendency to scaling was seen. Certain rete cells show intracellular edema while others are somewhat swollen and stain faintly.

Derma: The entire derma is markedly thickened. The hyperplasia is due partly to a swelling of the collagen, an increase in the connective-tissue cells, fixed and transitional, and to a very marked dilatation of both blood and lymph-vessels and the presence around both of fairly dense cell infiltrations. The latter consists of some mononuclear and polynuclear leukocytes, a great many lymphocytes and a considerable number of plasma cells. Extensive capillary hemorrhages are noted in the pars papillaris. The walls of the larger blood-vessels show no evidences of degenerative changes. The elastic fibers are seen only in the deeper portion of the derma and appear thickened and broken. In the center of the sections there is an abscess. This has evidently begun as a follicular pustule and has then extended downward in an hour-glass shape. Surrounding it is a perifollicular infiltration of leukocytes, lymphocytes and connective cells with considerable number of red blood-corpuses. No giant cells and no chorioplaques were found. The sweat and sebaceous glands show periglandular infiltration. No evidence of either syphilis or tuberculosis is seen. Macrophage cells (*Schaumzellen*) as described by Passini²⁷ were not found.

Figures 2 and 3 show the convex outline of the lower border of the lesions and the centrifugal extension of the process downward. It has not extended beyond this limit in the last two years, but shows some activity, as seen on the upper border. The photograph was taken in February and represents the usual, although at this time slight, winter exacerbation.

26. Kudisch: Drei Fälle von Bromoderma Tub. Veget., Dermat. Ztschr., 1912, p. 703.
27. Passini: Pathology des eruptions bromides, Ann. de Dermatol., 1906, No. 7, p. 1.

tion. At present, in June, there are no ulcerations visible. The leg shows now a reddish-brown, smooth, slightly scaly, atrophic appearance. Its circumference is two inches less than the right one. The skin is tensely drawn and when pinched shows thin-ridged sallow papery folds. The whole process has lasted over three years. Bromids are taken and discontinued occasionally and for a short time. Bacterial cultures were negative, chemical analysis of sections also negative. The urine showed specific gravity of 1.013, traces of albumin, a large excess of indican, subnormal excretion of urea, frequent crystals of calcium oxalate. No bromids were detected after careful search. This finding corresponds with the veracity of the patient with reference to the ingestion of bromids.

DIFFERENTIAL DIAGNOSIS

In the foregoing the confounding of medicinal eruptions with syphilis has been dwelt on as the most serious of possible mistakes. I will try to offer some points on differential diagnosis. The sudden onset and the usual topographic distribution of these eruptions should be constantly kept in mind. Thus, a pustular bromid acne will develop more acutely than a pustular syphilid. It will show a predilection for the head, face, and extremities, while the syphilitic eruption will be found irregularly scattered over the body though it adheres more or less to a symmetrical arrangement. Bromid acne extends down into the cutis and is harder to the touch than the syphilitic or necrotic variety. The absence of inflammation in acne cachecticorum will serve to distinguish it from bromid acne; and from acne vulgaris it can be differentiated by its rapid and simultaneous appearance on the scalp and other hairy parts, by the absence of seborrhea oleosa and comedones and of other concomitant signs of pilosebaceous gland alterations. Finally, bromid eruptions like to develop on scar tissue.

Acne caused by iodine has a more acute onset. Ehrman,²⁸ however, classes it also with the bromid variety, while Szadeck attributes to the former a more acute beginning. I venture to remark that the affection of the mucous membranes as an almost always present symptom of iodine intoxication, will serve as an useful differential diagnostic sign. It should also be remembered that the iodine eruption shows a tendency to assume a bullous type.

To distinguish it from an exulcerated iododerma is at times very difficult. This develops from the bullous type, rarely observed in bromoderma and is accompanied by a highly inflamed, often erysipelatous, swelling, deeper necrobiosis and more intensive systemic disturbance. Moreover, it does not occupy, as does the bromoderma, the lower extremities by predilection, and does not show the marginal honeycombed smegma-excreting walls. The examination of the urine and anamnesic data will also prove helpful toward a correct diagnosis.

Both the bromoderma and the iododerma offer at times insurmountable difficulties to differentiation from the exulcerated gummous syphilid. Both form ulcers by central breaking down; both show steep walls. The studded pustular points around the margin, the flabby, sluggish feel to the touch of the bromoderma, will vividly contrast with the gyrate serpiginous configuration and convex margin of the ulcerating tuberculosyphiloderm. The Wassermann reaction and, eventually, a provocative salvarsan injection will soon solve the question.

TREATMENT

The antagonism between the two haloids, bromine and chlorine, one replacing the other and vice versa, has been utilized against bromine intoxication. Bromine retention in the system is due to ineffective kidney excretion. Bromine is absorbed quickly from the intestine, and if not excreted soon by the intestinal tract it rapidly manifests itself in the blood, displacing its chlorides. It is, therefore, administered in cases of bromine intoxication in epileptics when untoward symptoms require cessation of the bromids. The same holds good in skin eruptions. Theoretically, the application of saline compresses on bromodermas and the ingestion of table-salt would recommend themselves. Ulrich²⁹ recommends also salt baths for the same reason. Ointments invariably aggravate the condition. In my case rest and a 4 per cent. boric acid solution applied continually and held in place by a soft gauze bandage kept moist, was very effective.

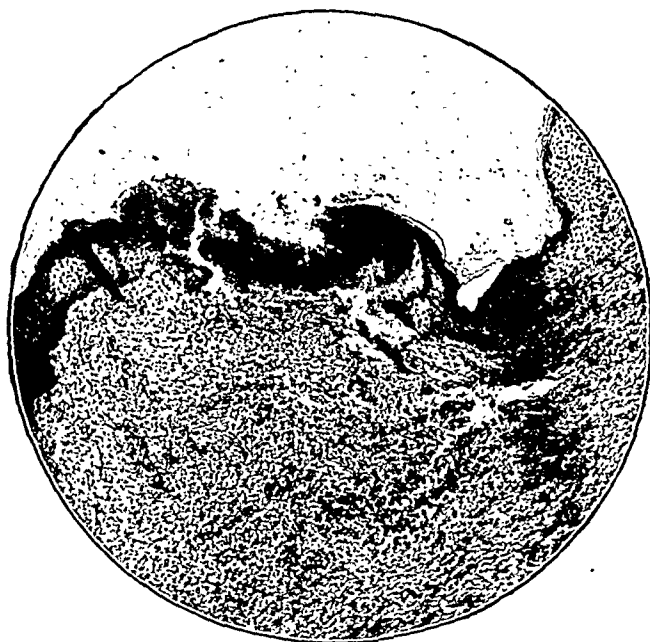


Fig. 5.—Bromoderma. Pustulation, atrophy of epidermis. Hemorrhage and round-cell infiltration.

CONCLUSIONS

1. Drug eruptions may simulate almost any known skin affection.
2. A skin eruption starting suddenly without any prodromal symptoms is almost sure to be a medicinal eruption.
3. The violence of development, the preponderance of the local over the systemic disturbances is characteristic of drug eruptions.
4. The brevity of the acute stage and the quickness of defervescence constitute a notable asset in diagnosis.
5. The usual four stages of the acute contagious exanthems, namely, the prodromal stage, the eruptive, the fully developed and retrogressive and the desquamative stage are wanting.
6. The temperature never rises to the point shown by the acute exanthems and the affection of the mucous membrane is never so severe.

42 West Ninety-First Street.

28. Ehrman: In Mracek's Handbuch der Hautkrankheiten, Vienna, 1891, part 3, p. 505.

29. Ulrich: München. med. Wchnschr., 1910, No. 22.

ABSTRACT OF DISCUSSION

DR. ERNEST L. McEWEN, Chicago: Cases of bromoderma are sometimes found in epileptics in which the skin eruption closely simulates blastomycosis. I recently saw a bromoderma in a girl of 16, an epileptic, who for a long time had been taking large doses of bromids. The lesion in this case appeared suddenly and extended rapidly, totally unlike what we see in true blastomycosis. Dr. Oliver S. Ormsby of Chicago, reported a similar case some years ago, in which the lesion spread with astonishing rapidity and closely simulated blastomycosis.

DR. A. RAVOGLI, Cincinnati: Not long ago I saw a child with massive tumors on the face and head. The child had been treated with the Roentgen rays and was getting worse and the treatment had also set up a Roentgen dermatitis. On inquiry, it was learned that the child had been taking bromids, and when this was discontinued, the lesions healed under simple treatment. I have also seen an acneiform eruption on the legs, due to bromid which was very difficult to diagnose.

DR. M. L. RAVITCH, Louisville: I do not agree with Dr. Weiss that these cases are so very unusual; I think many cases of bromodermas have been reported in the literature, and I have seen many cases more in private practice than in the asylums. The insane patients stand bromids better than normal people. I recall one case of bromoderma in an infant in which the diagnosis of small-pox was made and the child sent to an isolation hospital. I do not think bromoderma is confined to any particular season of the year. I have seen cases of bromoderma simulating blastomycosis, in winter, fall and summer.

DR. GEORGE M. MACKEE, New York: I had the opportunity of studying this case very carefully, and it offered considerable difficulty in the diagnosis. Among other things, we considered tuberculosis, syphilis and blastomycosis, and finally arrived at the correct diagnosis by the process of elimination.

DR. LUDWIG WEISS, New York: Bromoderma is not a very rare condition, but in my case there were some unusual features. The hemorrhages from the vegetations were at times very profuse, owing to the dilated venous loops in the papillary layer. I mentioned the seasonal occurrence of bromoderma only as a curiosity. We find that erythema-nodosum and other forms of erythema are worse in cold weather and improve in the summer. As Dr. MacKee has already pointed out, the lesions in this case had to be and were differentiated from a syphilid, pemphigus and other forms of eruption.

The side or base of the nail, however, may occasionally be first involved. Rarely the whole nail appears to be simultaneously attacked, and there is a more or less universal involvement of the whole horny substance. If the nail does not flake and break away, leaving a rough, uneven, diseased surface, it is very



Fig. 1.—Ringworm of nails.

much thickened and deformed. Only one nail may be involved, or several or all. The thumb, index-finger and middle fingers are the ones most commonly attacked, and as the nails are generally infected from



Fig. 2.—Favus of the nails.

FAVUS AND RINGWORM OF THE NAILS

MILTON H. FOSTER, A.M., M.D.
Surgeon, U. S. Public Health Service

NEW YORK

Favus and ringworm of the nails are supposed to be rather rare conditions. The finding of 101 such cases among the aliens arriving at Ellis Island during the first eight months of the present fiscal year goes to show that these disorders are probably more common, at least among our foreign population, than is generally believed.

Clinically both diseases present practically the same symptoms. The affected nail is thickened, brittle and sometimes even caseous. The natural color and transparency of the involved portion is lost and it becomes opaque and yellow or dirty-white in appearance. The process generally starts at the distal end and slowly infiltrates the nail toward the base, the diseased portion crumbling away gradually, because of the trauma to which the part is necessarily exposed in the ordinary vocations of life (Figs. 1, 2, 3, 4 and 5).

scratching the scalp, this distribution would be expected.

The disease does not appear to be painful nor does it seem, at least in our experience, to predispose toward setting up any acute inflammatory conditions of the surrounding soft parts.

PROGNOSIS

The process is essentially chronic, and if untreated continues indefinitely. The youngest patient whom we have encountered was 3 years old, the oldest 72. Reliable histories were hard to obtain, but one unfortunate asserted that this condition had been present for fifty-two years.

DIAGNOSIS

While the mottled, yellow, thickened and crumbly condition of the nails affected is highly characteristic, there are other conditions, besides an infiltration of



Fig. 3.—Ringworm of the nails enlarged, showing peculiar deformity.



Fig. 4.—Favus showing crumbling of the nails. This case was of four years' duration.



Fig. 5.—Ringworm of nails showing general yellow infiltration but no loss of substance.

these specific fungi, which resemble it very closely. These are syphilis, psoriasis, eczema, simple atrophy and hypertrophy, grave constitutional disorders, and some other skin diseases (Figs. 6, 7, 8, 9 and 10).

When the nails are affected by some general constitutional process, it is usual to find all of them involved. In ringworm and favus one or more often escape. Hypertrophic and atrophic conditions of the nails likewise involve all of them and the entire nail substance.

Fortunately it is not necessary to endeavor to find clinical points of difference, as a microscopic examination enables us to make the diagnosis with certainty.

METHOD OF EXAMINATION

Several drops of a 20 per cent. solution of potassium hydroxid in water are placed on a slide and a few fine scrapings from the suspected areas dropped in the solution. The slide is moderately heated once or twice and allowed to stand a few minutes. In a little time the suspected material becomes increased in size and soft in consistency. The "clearing-up" process may be hastened by gently separating and dividing the specimen with an ordinary teasing-needle. Several of the smaller bits of the softened scrapings are then placed on another slide and a drop of the

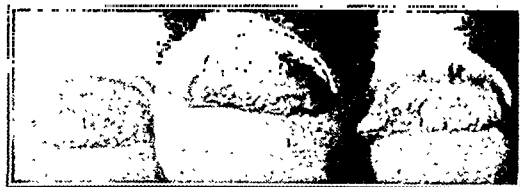


Fig. 6.—Simple hypertrophy of nails, end view, natural size. The patient, an alien, asserted that the condition had existed from birth.



Fig. 7.—Simple atrophy of nails, asserted to exist from birth.

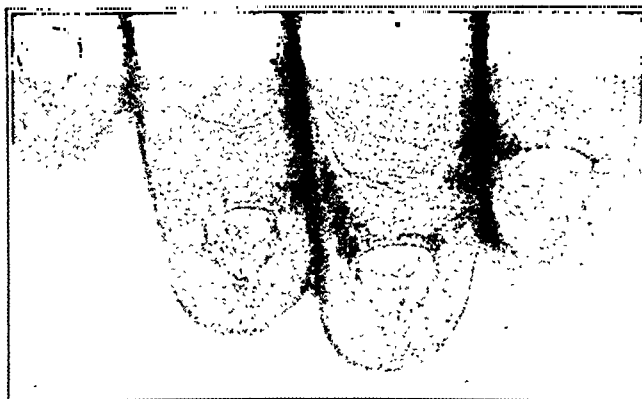


Fig. 8.—Atrophic condition of nails due to severe burn received during childhood.

solution of potassium hydroxid added and a cover-slip placed over all. The slip is gently pressed down so as to make a fairly thin preparation.

Examined with a 4 eye-piece and a 7 objective with subdued light, the fungi appear as highly refractive, slightly greenish, transparent, branching threads among the partly disintegrated elements of the nail. If properly applied the potassium hydroxid solution clears up and partially dissolves the normal nail material, leaving the fungi standing out distinctly in the field (Figs. 11, 12, 13 and 14).

If the clearing-up process is too slow, reheating will hasten it. A little search may be

necessary to find them, but in many specimens every field will be found to contain a number of the threads. Generally the organism of both favus and ringworm when obtained from the nails appears as plain, hyaline, branching threads which here and there show faintly the separation into spores or which contain at more or less regular intervals a small, round, highly refractive spore. Occasionally, as in the illustrations, the spore formation is very prominent; but such a distinct separation into spores is not the rule.

INVOLVEMENT OF THE SKIN OF THE PALMS AND FINGERS

In a number of these cases I have noted that the skin of the palm and palmar surface of the fingers was unusually hard, horny, calloused, and had a tendency to crack and peel off in flakes. While this condition is generally observed to a moderate degree in laborers

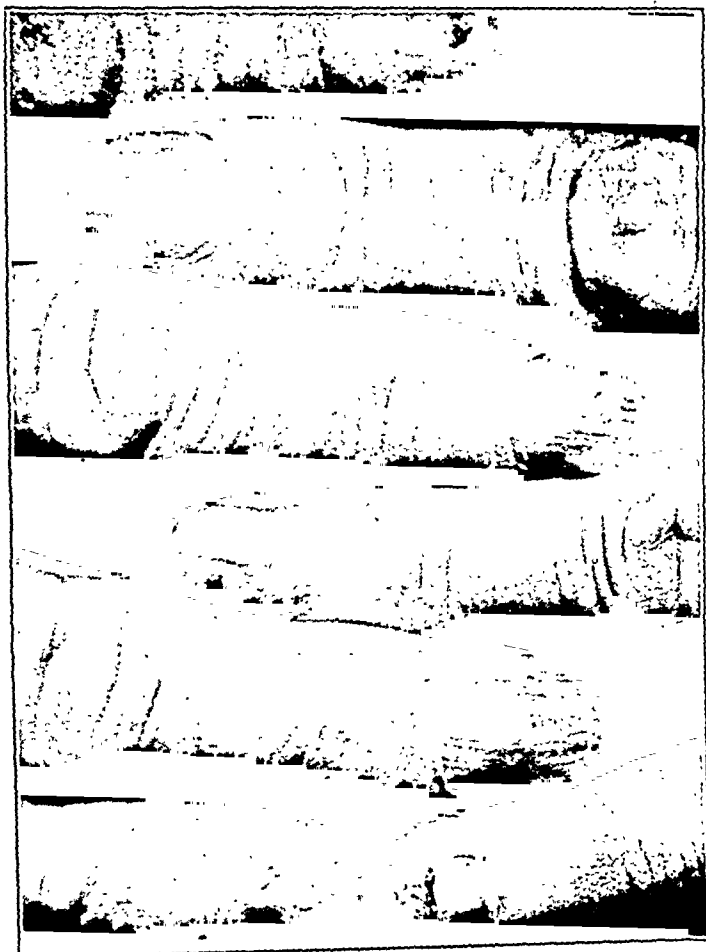


Fig. 9.—Syphilis of the nails. The palm of this case is shown in Figure 17.

who use the pick and shovel constantly as a means of livelihood, yet it is unusual to see it to the extent present in many of these nail cases. We have lately been examining scrapings from these hands and have found the organism to be generally present in the skin, presenting practically the same appearance as in the nails.

While ringworm and favus of course frequently attack the glabrous skin, the clinical symptoms when involving the thickened horny epiderm of the palm and fingers is so different that there is no similarity to ringworm elsewhere (Figs. 15, 16 and 17).

The lesions are not red or circular, but merely what would ordinarily be considered as an extreme degree of callosity with a marked tendency to peeling, and it would appear that this disease in this location has been frequently overlooked, as I have found no description of this condition in the literature on the subject to which I have access.

DIAGNOSIS OF FAVUS FROM RINGWORM

As stated above, both disorders present clinically practically the same symptoms, and the fungi of ringworm and favus when obtained from the nails resemble each other so closely when examined microscopi-

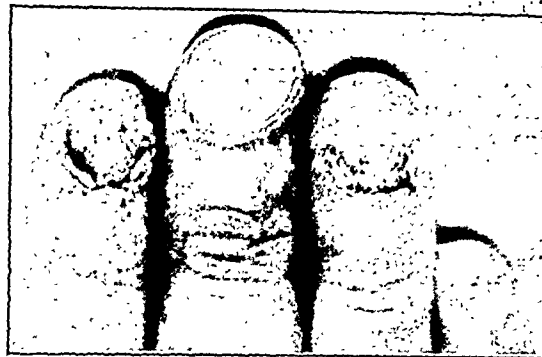


Fig. 10.—Idiopathic loss and destruction of two nails. Case was kept under observation for a number of weeks and repeated examinations made, but no cause for the condition could be discovered.

cally that a separation of the two diseases on these findings alone is generally impracticable. If there be favus of the scalp or elsewhere on the body, or if the scalp bear the scars of old favus, it is proper to assume that the condition of the nails is also due to the same organism. Similarly if other parts are involved with ringworm, it is likely that this is also the cause of the onychomycosis. If neither active favus nor ringworm is present elsewhere, and there is

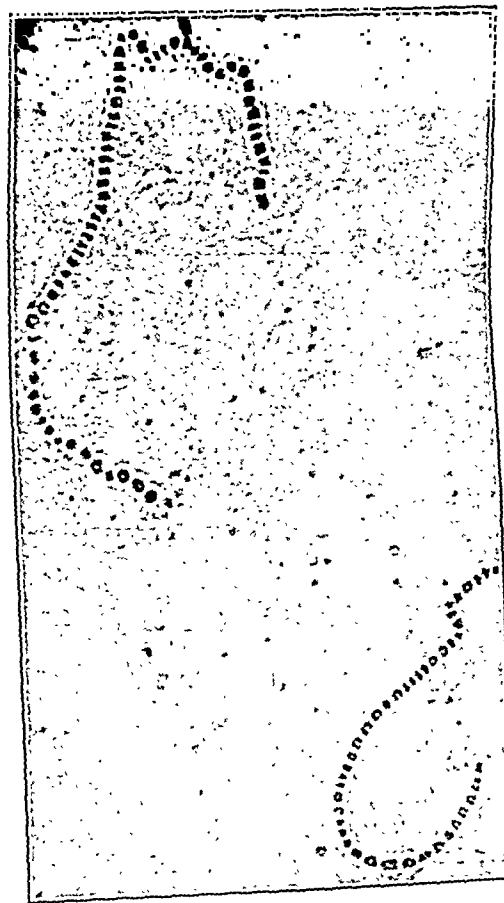


Fig. 11.—Photomicrograph of the organism of ringworm, X 330. It is unusual to see such marked spore formation.

no evidence of old favus, it is customary to make a diagnosis of ringworm, as ringworm of the scalp often disappears spontaneously after puberty and leaves no scars, and it is likely that the disease was transferred to the nails when it was active in the scalp.

COMPARATIVE FREQUENCY OF THE TWO DISEASES

In our series of 101 cases eighty-four were ringworm and seventeen favus. This would indicate that ringworm is encountered about five times as often as



Fig. 12.—Photomicrograph of the organism of ringworm, $\times 330$. It is unusual to see such marked spore formation.

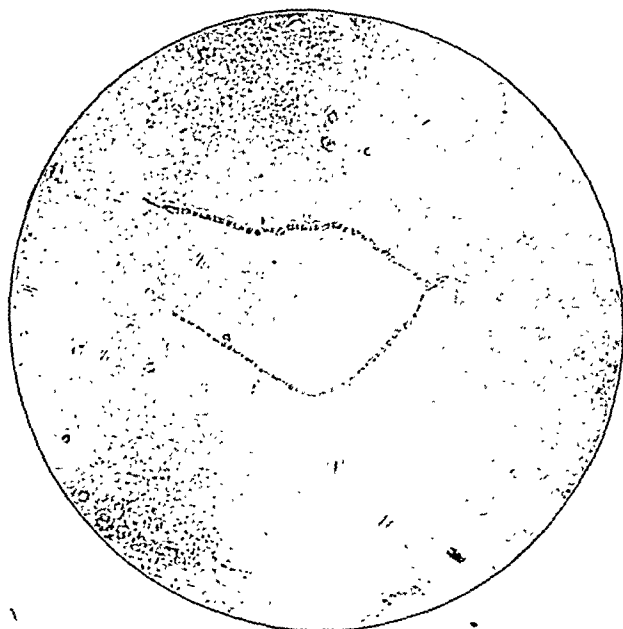


Fig. 13.—Photomicrograph of the organism of favus, $\times 330$. Usually the spores are not so distinct. From the case shown in Figure 4.

favus. It may also be interesting to know that these 101 cases were discovered among 521,366 aliens who were examined. Roughly speaking, the ratio of cases was about one to five thousand of these foreigners.

TREATMENT

All authorities agree that the onychomycoses are extremely stubborn and resistive to all forms of treatment, and from the pathology of the disorder we would expect this to be the case.

The organism grows into the nail substance and down into the matrix, where it cannot be reached by any local applications. Any form of treatment must

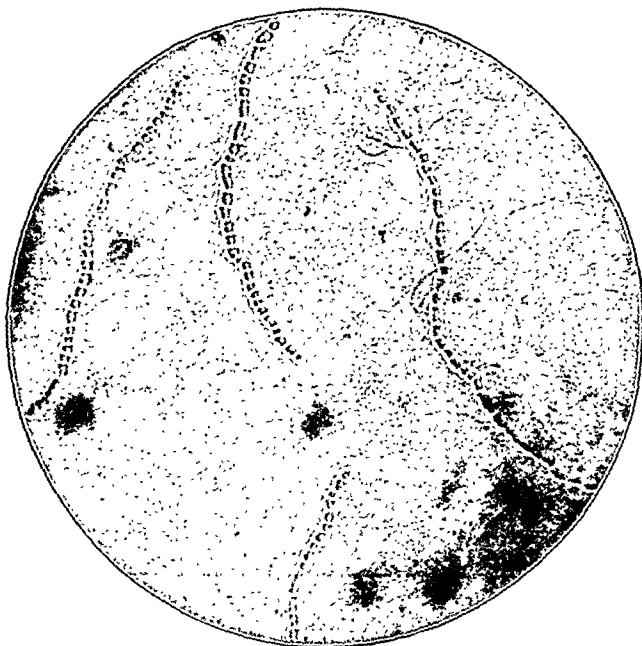


Fig. 14.—Photomicrograph of the organism of favus, $\times 330$. Usually the spores are not so distinct. From the case shown in Figure 4.

be preceded by curetting and scraping away the diseased part of the nail so as to apply the antiseptic to the denuded surface. Continuous application of the desired remedy may be obtained by pulling rubber fin-

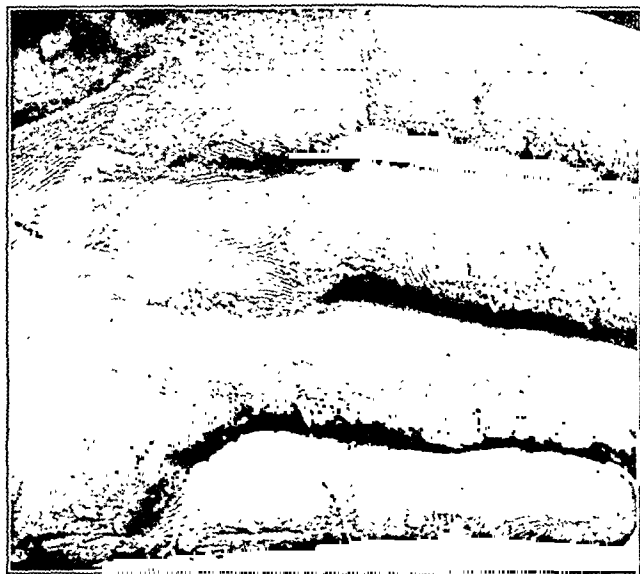


Fig. 15.—Ringworm of the palm. The nails also were involved.

ger-cots over the infected fingers and placing the medicine inside of them. Care must be taken to avoid setting up a general inflammation of the part by too severe or too prolonged treatment.

Stelwagon recommends dipping the finger-ends in a solution of mercuric chlorid, from 1 to 3 grains to

the ounce, for from five to ten minutes daily, allowing it to dry in and then enveloping the parts with an ointment of white precipitate or calomel, a dram to the ounce. He also recommends the use of a 20 per cent. solution of sodium thiosulphate, subsequently followed

years by several skilful men, one of them an eminent New York specialist. They were then treated as outpatients in another hospital for six months. At the expiration of this two years and six months' treatment, a microscopic examination showed the organism in all of them and they were apparently no nearer a cure after all this prolonged medication than at the beginning.



Fig. 16.—Favus of the palm; the nails also were involved.

by enveloping the fingers with an ointment of precipitated sulphur, 1 dram to the ounce. He also speaks of Harrison's treatment, which consists in applying a 6 per cent. solution of potassium iodid in equal parts of 20 per cent. solution of potassium hydroxid and spirits of wine for three or four minutes at a time. This is done two or three times at intervals of two or three days, and then Solution 2 is applied. This solution consists of 4 grains of mercuric chlorid dissolved in 4 drams each of spirits of wine and water. It is asserted that by this process mercuric

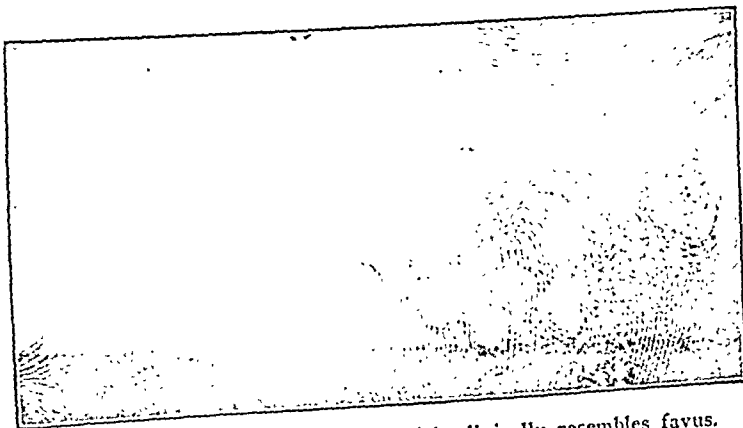


Fig. 17.—Syphilis of the palm, which clinically resembles favus.

iodid is formed deep in the tissues. Tincture of iodine and a host of other germicides have been recommended.

My experience with these remedies on the nails is too limited to justify my expressing an opinion concerning their utility. Concerning ringworm of the scalp, I am in a position to say that all medical applications in my hands have been extremely disappointing. We have the records of a family of three children aged, respectively, 6, 8 and 11 years, who were treated most persistently in two hospitals for two

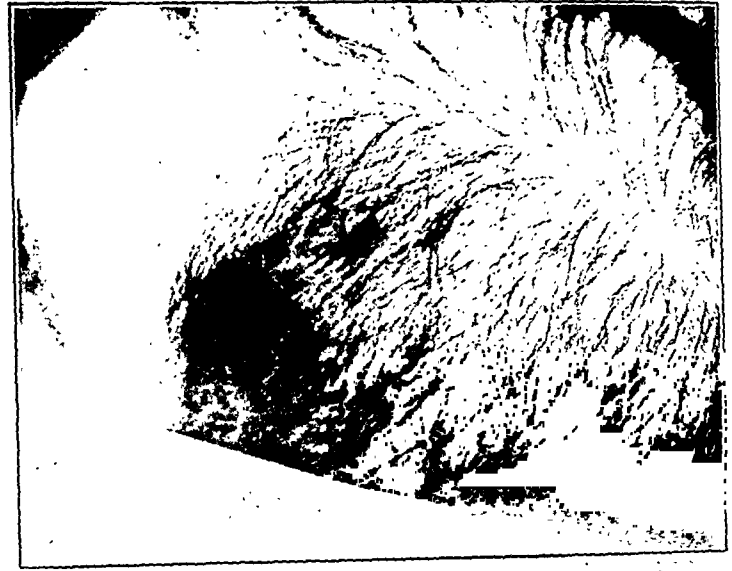


Fig. 18.—Wiry hair and scarred scalp following favus in a young adult.

I am of the opinion that some of the reported rapid cures of ringworm of the scalp were either errors of diagnosis in the first place or that the cure could not have been sustained by a competent microscopic examination. I have frequently seen patients in whom the clinical symptoms promptly disappeared



Fig. 19.—Old favus of the scalp and active favus of the nails. Cause and effect.

in a few months on the application of the ordinary remedies, but in whom a microscopic examination revealed plenty of hairs infested with the spores of ringworm.

Much more encouraging reports are made from the use of the Roentgen ray, but as it has no direct action on the organism and acts simply by producing epilation (*Sequeira*), it would not appear to be applicable in combating the condition in the nails.

In view of the tediousness and uncertainty of medical treatment, the avulsion of the nail and the application of some germicide to the matrix may be justifiable. We have adopted this procedure in two cases.

PROPHYLAXIS

When the hands and nails are involved by either of these fungi, the likelihood of their transmission to others is probably much greater than in cases of the same disorder occurring in the scalp. The sufferer is constantly scattering far and wide particles of disintegrated nail substance and flakes of skin which are loaded with the organism. His hands are continually in contact with objects of common use and very often directly with the persons of others. More ideal conditions for disseminating the infection could scarcely be devised. Imagine the situation should a barber or hair-dresser contract the disease in the nails and continue to practice his vocation!

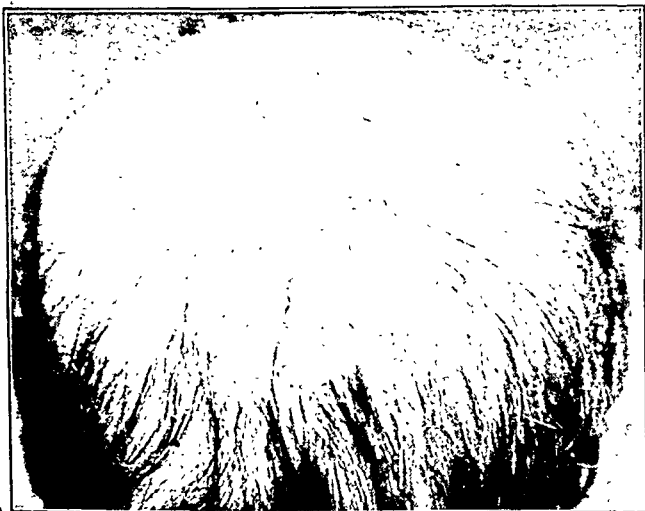


Fig. 20.—Old favus, recovered, of the scalp, in man aged 28. Note the loss of hair and the coarse, wiry appearance of the hair present.

Favus of the scalp or nails is a severe and loathsome disease. Unless energetically and carefully treated from the start for a very long period, it always results in permanent loss of the hair and scarring of the scalp in the areas involved with great disfigurement (Figs. 19 and 20).

Fortunately the disease is rather infrequent in America and our strict immigration inspection prevents new cases from being introduced from those foreign countries in which it is prevalent.

In view of the danger to the community at large, it would seem that favus should be added to the list of notifiable diseases and that cases occurring in this country should be placed under such restraint by the local health authorities as may be necessary to prevent the spread of the disease to others.

My thanks are due to Surgeon L. L. Williams of the U. S. Public Health Service for his kindness in permitting me to refer to these cases. I desire also to make my acknowledgments to Assistant Surgeon J. H. Smith, who has done the microscopic work, and to Pharmacist Charles Slough who has given valuable assistance in making the negatives.

Ellis Island.

A COURSE IN SURGICAL TECHNIC*

WILLIAM COGSWELL CLARKE, M.D.

AND

FREDERIC W. BANCROFT, M.D.

NEW YORK

The course in surgical technic here described was designed to meet a demand in the surgical training given in Columbia University. It is realized that familiarity, by actual observations on animals, with the use of aseptic materials, the appearance and manipulation of living tissues, the control of hemorrhage, and the methods employed to prevent contamination and subsequent infection of recent wounds, is an equal advantage to the graduate whether he enters practice immediately on graduation or prepares himself further by a hospital training. The opportunity to participate in operating-room routine, such as the preparation of the patient, the surgeon, the instruments and materials, is now of recognized value, and this recognition has created a need for special training in the details of aseptic surgical technic.

The course is given to fourth-year medical students in the Laboratory of Surgical Research, where there is a well-equipped animal hospital. In order to provide an opportunity to educate recent hospital graduates in teaching methods as well as to instruct the students, the teaching staff has been made unusually large. It includes twelve instructors in surgical technic and two in surgical pathology, all of whom have had surgical service in a hospital.

Four of these instructors are on duty at the same time. Each instructor serves for three months, but, by a scheme of rotation, he acts as assistant instructor during the first two, supervising the students at one table where he fills the place of second assistant, while during the third month he is instructor in chief and attending surgeon at the University Animal Hospital, where he makes a daily visit. The schedule is so arranged that each instructor becomes the chief twice in a period of twenty-four scholastic months.

The course is an optional one, but so great is the interest it has aroused that at least three-fourths of the fourth-year students elect it, and each of the sections into which the class is divided contains ten men on an average. Each section receives instruction for eight periods of two hours each. It is divided into groups of three men, so that an average section furnishes operating staffs for three tables, and the men at each table rotate at successive lessons in the position of anesthetist, first assistant and operator.

The nurse in charge is a graduate of a hospital training-school. She is familiar with all surgical requirements and has supervision over the animal hospital and operating-room, under the direction of the attending surgeon on duty. At its initial lesson she instructs each section in the preparation of surgical supplies and their sterilization, the care of instruments and utensils, and in the manipulation of sterile gowns, gloves, etc. She also prepares for the operative sessions exactly as in the operating pavilion of any first-class hospital.

The operating-room is furnished and equipped on modern lines. It is 20 feet square, lighted by side-lights and skylights, and provided with powerful arc-lights. Adjacent rooms are used for sterilizing, anes-

* From the Department of Surgery, College of Physicians and Surgeons of Columbia University, New York.

thetia and private operations, and there is a detached room for necropsies. The sterilizing plant includes an autoclave, instrument boiler, utensil boiler and water sterilizers of the latest type.

The animal hospital has been fitted up with every regard for the animals' comfort. Each animal has a separate cage, and there are especially heated ones for recovery from anesthesia. The entire time and attention of one man is given to these animal patients. The animals themselves, as well as their surroundings, are kept scrupulously clean with the aid of a bath-tub, sluicing-hose, proper disinfectants and abundant light and ventilation. As the hospital is maintained to treat animals with surgical lesions, many dogs suffering from tumors, infections and prolapsus uteri have been received as private patients. Thus the students under direction of the attending surgeon have had the opportunity of assisting at operations on real pathologic conditions. In his daily visits the attending surgeon inspects all the animals and gives such directions for

performed, and intestinal suture illustrated. Technic of applying dressings.

THIRD SESSION: Lateral entero-enterostomy.

FOURTH SESSION: Posterior gastro-enterostomy.

FIFTH SESSION: End-to-end entero-enterostomy, by suture.

SIXTH SESSION: Exploratory laparotomy, for a stab-wound of the abdomen, inflicted under anesthesia. The location and repair of the lesions are demonstrated.

SEVENTH SESSION: Nephrectomy, illustrating the treatment of the pedicle.

EIGHTH SESSION: Repetition by each table of any operation which has been unsuccessful.

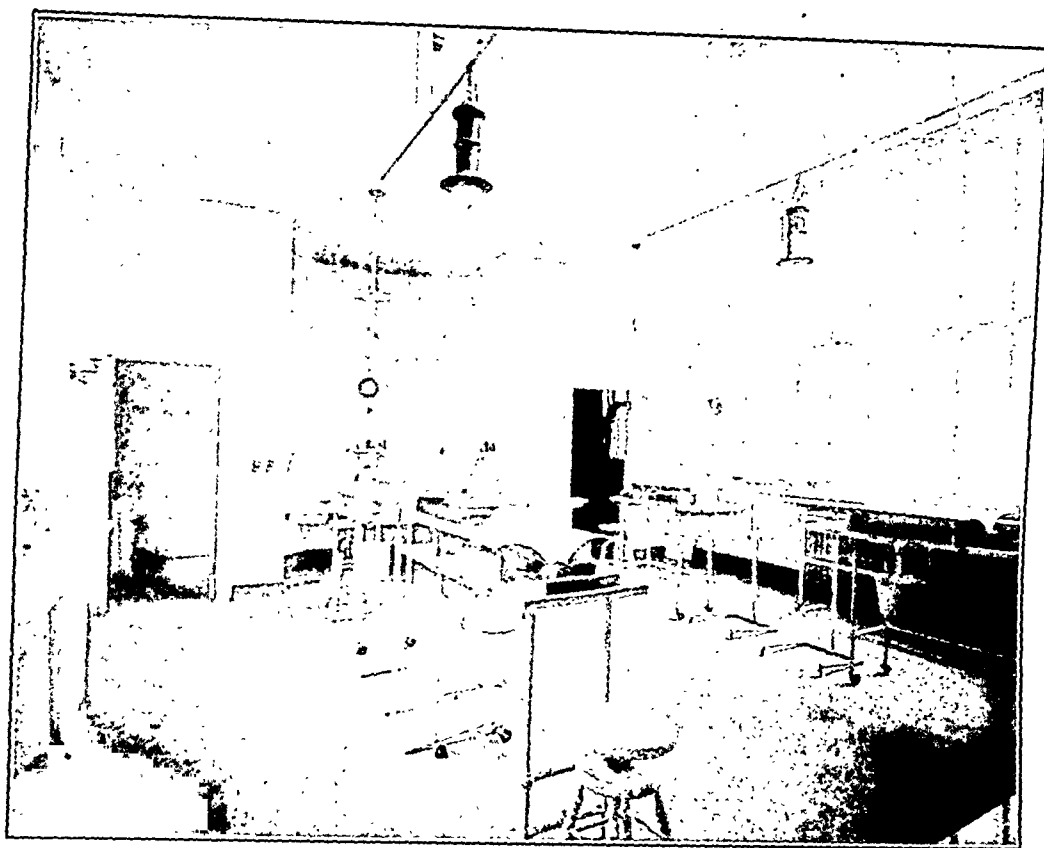
The routine of a session is as follows: The chief instructor outlines briefly, at the beginning of the lesson, the steps of the operation to be performed, illustrating them by diagrams on the blackboard. He then assigns the students to their duties, and the usual routine of an operating-room begins. The anesthetist starts the anesthesia in the etherizing-room, the animal is placed on the operating-table and the field prepared by the first assistant (the hair has been removed and the animal given a full bath on the day before by the attendant). The skin is prepared by scrubbing with green soap and water, then with alcohol 70 per cent., and rinsing with mercuric chlorid 1:10,000. The table is then wheeled into the operating-room and draped with sterile sheets by the operator, who has previously scrubbed up and has put on cap, mask, gown and gloves, under the supervision of his instructor.

During the operation the instructor at each table directs every step and calls particular attention to the observation of asepsis, handling of instruments, placing of sutures, control of hemorrhage and the importance of handling living tissues with gentleness. Before leaving the room the student operator writes a description of his procedure on the history sheet of the chart, which is to hang by the animal's cage.

At the conclusion of the operation, every step of which has been

done under full anesthesia in every case, suitable dressings are applied to the wound and the animal is carried to the hospital and placed in a "warming cage," in order that chill may be prevented and the animal made comfortable. The animal receives special attention during convalescence, its temperature and general condition are noted daily on the chart, and the diet is carefully regulated by the attending surgeon. The student-operator is urged to visit his convalescent patient and to consider the outcome of his procedure of importance equal to that of the operative result on a human being.

At the beginning of each operative session, necropsies are performed by one of the instructors in surgical pathology on any animals which have died as a result of operation. A few, selected from the convalescents, are chloroformed and necropsied for the purpose of showing the students the contrast between the normal repair at various intervals after operation, and



Operating-room for the class in surgical technic, Department of Surgery, Columbia University.

their care as may be necessary to the nurse in charge and her assistant. Daily notes of temperature and general condition are entered on each patient's chart for the information of the surgeon and the students.

In order to preserve uniformity of instruction, the professor of surgery has prescribed a definite series of demonstrations and operations for the course. A printed outline of these is furnished to every student at his first lesson.

FIRST SESSION: The course opens with a lecture and demonstration on (a) suture materials and instruments; (b) preparation and sterilization of surgical supplies; (c) the administration of anesthetics to animals; (d) the preparation of the animal for operation; (e) the sterilization of the surgeon's hands, and relative values of different methods in use, and (f) prescribed method of putting on cap, mask, gown and gloves.

SECOND SESSION: The abdominal incision and its repair in layers. Repair of wounds in the intestine. Enterotomy

the pathologic conditions produced when an operation has been unsuccessful. Attention is drawn to the resistance of the healing wound to tension, in both abdominal and intestinal walls, to the constant formation of peritoneal adhesions, and to the benefit or harm which may result from the attachment of the great omentum to the various viscera. Preceding a necropsy on a pathologic animal, the student who operated on it is questioned as to his procedure, and as to any postoperative symptoms which might indicate the cause of death. He is also questioned regarding the treatment he would pursue with a human patient who exhibited similar signs and symptoms, and is asked to give his reasons therefor. Thus a constant effort is made to keep clear in the minds of the students the clinical aspects of the case, and the importance of necropsies is emphasized, as a means of correlating them with the various pathologic conditions and processes that are found to exist. This practice is intended as an aid to the interpretation of physical signs and to the understanding of the principles of treatment in human surgery.

Specimens of tissues are selected at the necropsies, and microscopic sections are made to show the students the cellular morphology of all common postoperative conditions, including wounds healing by first intention, infected wounds, and the various types of peritonitis, with or without adhesions. At the close of each necropsy, the student-operator is required to write a complete report of the pathologic findings, and these reports are bound with the histories. To increase the interest of the students, a comparative record of the results of each section's work is kept, which proves a stimulus to both students and instructors.

The routine performance of necropsies has brought out many interesting surgical facts which should be of lasting benefit to the students. Peritonitis occurred most frequently after the operation of end-to-end intestinal anastomosis. In the cases of gastro-enterostomy the most frequent cause of death was pneumonia, suggesting the increased percentage of pneumonia due to surgical interference in the upper abdominal cavity. To indicate the value of pathologic material that may occur during the year and the benefits that may be derived from the study of such material, a few of the unusual causes of death occurring with the various operations are briefly mentioned here:

1. *Gastro-Enterostomy*.—One case of enormously distended stomach with contracted intestines, due to a small band with a valve-like action, causing obstruction to the entrance to the jejunum. One case of death due to inanition caused by anastomosis of the stomach to the descending colon; here sufficient care had not been taken to identify the loop of intestine used for the anastomosis.

2. *Enterorrhaphy*.—One case of gangrene of the intestine in which the intestinal clamps had been too tightly applied.

3. *End-to-End Entero-Enterostomy*.—One case of cirrhosis of the liver with ascites; death was due to oozing. One case of infection of the abdominal wound, followed by protrusion of the omentum with beginning gangrene.

4. *Exploratory Laparotomy for Stab-Wound*.—One case of general peritonitis, due to an overlooked stab-wound in the intestine. One case of thrombosis of the

superior mesenteric vein, with gangrene of the small intestine. This was probably due to excessive traction on the mesentery, as no other cause could be found. One case of general peritonitis due to a gauze sponge that had been left in the abdominal cavity.

The sections that saw these last three necropsies learned a lesson in surgery which they will probably never forget, so clearly was brought out the necessity for careful handling of the tissues, and for keen systematic observation.

Intussusception was found to be a frequent cause of death, and has apparently no relation to the type of operation performed. It is probably due to the handling of the intestine. Both cross-sections and longitudinal sections have been made to show the students the relations of the layers of intestine and constriction of the mesentery in such conditions.

The private animal patients admitted to the hospital have been the means of demonstrating several neoplasms as well as other instructive conditions. One student section had the opportunity of operating on congenital oblique inguinal hernia occurring in three youthful pigs, all from the same litter. The students had the subsequent satisfaction of having these three animals returned home, discharged cured, and the wounds healed by first intention.

The advantages of a course of this kind are numerous. The existence of a staff of instructors, each occupying in turn the position of chief, not only makes each instructor's service short enough to maintain constant enthusiasm, but also acts as a stimulus, because of the element of competition. Each surgeon has an opportunity to observe the teaching methods of his associates, and to note their merits or defects, with a view to increasing his own efficiency. The combination in a single course of the technic of operative procedure with the pathologic findings in the cases in which operation has been performed leads the student, when brought into contact with clinical cases, to reason in terms of pathologic processes and conditions. This assists him to correlate his knowledge of anatomy, pathology, bacteriology and physiology with surgery. He is trained to base his conclusions on observations of facts rather than on dogmas.

Finally, after such a course the student has become acquainted with the technic of asepsis, the use of surgical instruments and the other essentials of general surgical procedure; he has learned that an operation must be conducted exactly and methodically, and he has felt a personal responsibility for its success or failure.

When, therefore, he enters practice and is confronted with the necessity of operating, he is no longer an untried apprentice. Already familiar with the fundamental principles of aseptic surgical work, he is enabled to avoid many a costly mistake, and is far better fitted to do credit to himself and justice to his human patients.

437 West Fifty-Ninth Street—43 West Fifty-Fourth Street.

The Logical Starting-Point.—The diseases common to child life are spread by the mingling of the sick with those who are well. The public schools are the places where the children of all ages and degree assemble. It follows then that the public school is the logical point at which to begin the important work of controlling those diseases that are spread as has been stated, by the mingling of the sick with the well.—*Bull. Chicago School Sanit. Instr.*

THE MEDICAL SCHOOL AND THE STATE*

H. S. PRITCHETT, PH.D.

President, Carnegie Foundation for Advancement of Teaching
NEW YORK

The layman who ventures to speak concerning a matter so technical in some respects as medical education owes perhaps an explanation to the public and to the medical practitioners. What can the layman say as to the training of medical experts which is of value or which the public cares to hear?

There are three main reasons why the layman has a right to be heard in the matter. First of all, medical education is primarily a matter of education, not a matter of medicine. The educational test which shall be imposed, the premedical education itself, the educational methods of the medical school, are all matters not of medicine but of education.

Secondly, the layman who gives thought to these matters has a right to speak from the point of view of his own interest for it is the layman after all who is to be either made or marred by the medical practitioner. The general public is profoundly interested in the question whether the medical expert has been rightly trained for his profession.

In the third place, the layman is necessarily interested in the medical school as a matter of state administration. The legal conditions which are finally to be imposed on medical education may originate with medical practitioners, but they will be passed on and finally put in form by legislators. The matter of the public health will be in the keeping of skilled physicians, but the form of administration under which they will work and the relations of the different parts of this organization will be decided by laymen.

To put the whole matter tersely, the practice of medicine is a quasi public profession. The laws which admit to its practice must be framed by those who are not members of the profession, but who are looking at it from the point of view of the public good. Medicine will never gain its rightful place until the intelligent laymen, the legislator, the citizen, realize the public nature of the profession of medicine and their own obligations as to its support, its standards and its regulation.

It is this last relationship, namely, the relation of the state to medicine and to medical teaching, which we need at this time most clearly to develop. We need to distinguish between the opportunity of the individual on the one side and the obligation of the state on the other.

The public health of the inhabitants of a state is without doubt the largest single interest with which a state needs to concern itself. Expressed even in commercial terms it exceeds all others. Disease, ill-health, insanitary public conditions, cost more than any other form of public neglect. The conservation of the public health is therefore the largest interest to which the state must give its attention.

Our American commonwealths have begun only within a very few years to be conscious of this problem. In a few states steps have been taken to deal with the problem in orderly and efficient form. It therefore seems worth while on such an occasion as this to lay special emphasis on this public duty; to call attention to the fact that the medical school and the hospital ought to form the very heart of those

agencies by which the state undertakes to deal with the public health and that there must be worked out a form of administration under which the state shall coordinate all its agencies, the board of health, the medical school, the hospital, the laboratory, for an efficient handling of the problem of the public health.

The present demand for an effective organization of public health agencies arises out of the progress of what we call to-day scientific medicine as compared with what twenty-five years ago was empirical or sectarian medicine.

Following the great discoveries of the chemists, the biologists, the bacteriologists, all sectarian divisions of medicine became meaningless. Men came to realize that medicine is applied science and that it should rest like all other technical and scientific practice on the results of experimental knowledge. It avails itself of whatsoever could be shown by careful experiment to be true in the practice of any medical body. It subjects every appliance to the scientific test, and while this process wiped out all distinctions of caste it set up as a condition for entering the profession the possession of the inquiring, active, critical, scientific spirit. Sects in medicine are no more possible under this conception than in botany or astronomy. Deliberately to label oneself an allopath or a homeopath or an eclectic is to return to a past epoch of medical history.

One of the first results of this change of attitude in the profession in its relation to laymen lay in the willingness of the practitioner to admit the limitations of his knowledge. The student of scientific medicine no longer hesitates to say he does not know; he does not pretend to universal knowledge; but he has possession of methods which ultimately will lead to the solution of most if not all of our problems. Scientific medicine does not pretend to say that the solution of all these has now been attained.

Another significant result of the introduction of the scientific method and its universal activities lies in the fact that the emphasis on preventive medicine becomes greater. Modern medicine realizes that it is not enough to cure those already ill; it is not enough to build hospitals for the sick; it is not enough for the surgeon to relieve the pain of those actually suffering. All this is a part of the work of modern medicine, but a still greater part lies in the prevention of illness, in creating conditions favorable for health, in so dealing with the problem of the public health that there shall be a minimum of disease, a minimum of ill health, a minimum of suffering. It is the rise of preventive medicine, based on the science of chemistry, biology and physics, which has brought home to the state the realization of its own supreme duty in safeguarding the physical well-being of all its people. The state has long accepted the problem of caring for the helpless sick. To-day it faces the duty of preventing the helpless from falling into unnecessary illness.

The working out of this problem means not only the betterment of sanitary conditions, not simply the provision against infection and the stamping out of nuisances, but it means more than all else the education of the whole people of a state to the knowledge of the elementary sanitation laws. This education of the people lies at the very base of preventive medicine, and preventive medicine lies at the base of the state's ability to safeguard the public health.

The rise of preventive medicine and the enlargement of the state's function in the conservation of the public health is rapidly bringing about a change of attitude in our whole social and economic treatment

* Address delivered at the dedication of the Robert W. Long Hospital of Indiana University at Indianapolis, June 15, 1914.

of disease and ill health. In the past the care of the sick poor has been a matter of charity; the obligations of society no less than the ideals of Christian service have urged civilized men to continual effort for those suffering from illness who are in want of the necessities of life. This obligation and this service will not cease, but the vista which preventive medicine opens up enables us to anticipate a time when a large share of the suffering and disease which now falls to the lot of the poor will be prevented when the conditions of living will be more wholesome, when the need of charitable service will be limited to those cases which no preventive measures can safeguard. The entrance of the state into the great work of health preservation, while it will not be a substitute for private philanthropy, will nevertheless relieve much of the suffering to which private philanthropy has hitherto ministered, and it ought to diminish in an ever-increasing measure the suffering and the misery of poor and rich alike. This is one field of human endeavor in which an ounce of prevention is worth many pounds of cure.

If one looks forward a decade into the future along the lines which modern scientific medicine opens up, and if he admits that the state must shoulder the responsibility for a uniform and effective system of public health administration, it is clear that the state can accomplish this enormous service, that it can conserve the great interest of the public health effectively, only by some harmonious coordination of its various agencies. To-day the problem of the public health is dealt with by a number of agencies, often-times unrelated and disassociated. On the part of the state itself stands an official board of health with similar boards representing communities and cities. The medical school, the hospital and the laboratory are the natural agencies through which any administrative board of health must carry out its measures. Finally, the practitioners themselves must stand in some relation to the state's health activities. Some method must be worked out by which the profession of medicine, quasipublic as it is, shall find a relationship to the state and to the state's work in the matter of the public health which shall be more definite and more satisfactory both to the public and to practitioners than the present arrangement. To state the matter a little more definitely, if the state is to enter on a constructive program in the matter of the public health, if the general public through the state is to reap the benefits of a wise system of preventive medicine, an organization capable of dealing with the problem must be devised, and that organization must be elastic enough to include the board of health, the medical school, the hospital, the laboratory and the practitioner.

What form of organization will suffice for this fundamental public work? That question is the practical one which is to-day being attempted by many American states.

To accomplish the end sought there is needed not so much a hard-and-fast organization as intelligent cooperation between those which have been created. Thus a state board or commission with its executive officers will doubtless continue to be the organization through which the state authority will be exerted. The medical school with its hospital and laboratory will continue to be under the control of the university. Experience has shown that whatever be the weakness of the university, it has been the only agency through

which the spirit of scientific inquiry and devotion has flourished. Only in a university have scientific ideals had their fair chance to get into the practice.

What is needed, therefore, is the closest correlation between the state board of health and the university school of medicine. In the state of Indiana it is fortunate that all these agencies are under state control. This simplifies enormously the problem of working out a right coordination. However important and far-reaching are the powers of a state board of public health, the medical school will always remain the heart of the public health activities for the reason that in the medical school practitioner and student meet. The enthusiasm of the teacher and of the investigator give a spirit to the public health effort which no other combination can give. Here as nowhere else the laboratory of the chemist and of the biologist and of the pathologist are brought face to face with the problems of disease in the hospital. Of all human efforts, of all human organizations as yet devised, no other has brought together the same qualities of skill, of devotion, of enthusiasm, as that which comes from the association of student and teacher, of experimenter and practitioner. The medical school with its teachers, its students, its laboratories, its hospital, will be both the inspiration and the hands of the public health service. Fortunate it is for this state that it already controls and is developing a modern school of medicine, imbued with the spirit of scientific medicine, in touch with the research spirit of the day, and ready to develop into the most fruitful agency for the solution of the problems of the public health which this commonwealth must face. It is because I regard the medical school, and when I speak of the medical school I mean to include faculty and students, laboratories and hospital, it is because I regard the medical school and its proper development, its cooperation with the board of health, as the greatest step in the public health service that I venture to spend the remaining few minutes of my talk in a consideration of certain conditions which from the point of view of the educator make for the right growth of the medical school and therefore of the state service.

If the medical school is to be the right hand of the board of health, it must not only cooperate by the training of medical students, by the use of its laboratories for tests and examinations and by the study of disease in its hospital, but it must also take the broadest possible conception of its duties in the matter of education.

There are two fields of medical education which are generally overlooked and which the state school of medicine must vigorously undertake—one is the education of the public in the elementary knowledge of sanitary matters, the other is the education of the present generation of practitioners into an appreciation of the modern conception of the profession of medicine. I venture to spend a few words on each of these topics.

The education of the public into a practical knowledge of the elements of the science necessary for the conservation of the public health is still in its infancy. It has not yet been successfully undertaken by any school of medicine for its own state. By lectures, through the daily press (which has always been a cordial ally in such an endeavor) in all the ways by which a democracy can be educated, the people of a state must be taught the elementary science which prevents disease, cuts down the death-rate of infants, prevents the spread of infection, brings the appreciation of fresh

air and cleanliness to every citizen. Only in a very limited degree does the average intelligent man appreciate how much of the disease and suffering in his community is due to his own neglect. Finally, such a campaign of education must do something to teach the average citizen to use ordinary care in the selection of a medical adviser. It must teach him to discriminate between the graduate of a commercial medical factory and the graduate of a school whose ideals represent the highest step in our civilization, for there is no ideal of human service more creditable to our progress in civilization than that which is set before the student of medicine in our better schools.

There remains still an unfulfilled duty to the men now in the practice. Ill-trained and unfit as many of them are, they represent in a large majority of cases the victims of a condition. Few men deliberately choose a defective and impossible medical training. Well-meaning young men by the thousand have gone into such schools in the honest belief that they were to receive a fitting preparation for the profession of medicine. The victim of the commercial medical school usually finds out his mistake after he gets into practice. If he has the right spirit he seeks by every possible means to repair his defects. To such men the state school of medicine should offer a most hospitable opportunity.

The postgraduate school of medicine as it has hitherto been conducted has generally grown up apart from the university medical school. It has been generally conducted by groups of practitioners—sometimes with excellent purposes and motives, sometimes with a very strong commercial flavor. The postgraduate school should be by all means a part of the university medical school. To no other men will the spirit and ideals of the university hospital, laboratory and medical school be more welcome. And in no way can the medical school educate the people of a whole state so surely as to establish a helpful relation with every practitioner in the most remote village who has ambition for improvement. Every such postgraduate student becomes a center of education in the public health.

It ought to be clear to the layman as well as to the practitioner of medicine that a single school of modern medicine in a state like Indiana is the true solution of the problem of educating practitioners of medicine and of serving the public health. Indiana to-day has about as many doctors to the square mile as any state in the Union. For every 500 inhabitants, including men, women and children, there is an Indiana physician. This result is in part due to the fact that near the state of Indiana is the city of Chicago, which is the great factory for medical degrees. I regret that an institution in this state still conducts a medical school in Chicago. There is no justification for a second school of medicine in Indiana. One moderate-sized medical school, conducted on right lines, can supply more physicians than the state of Indiana can possibly absorb. For many years to come there will continue to be many more physicians, at least in name, than the state needs. In time we may hope that with a growing education of the public, the layman will select his practitioner of medicine with at least as much care as he would select a clerk or a foreman, that he will at least make some inquiry as to the source of his medical education and the extent of his medical experience. Until the public can be educated to know the difference between a well-trained practi-

tioner of medicine and one who obtained a degree by short-cut methods, the whole problem of the public health will be delayed.

In this connection I venture to spend a moment to emphasize one phase of this problem which is very commonly misunderstood. The plea put forward in behalf of the commercial medical school is couched in terms calculated to deceive the public. The commercial medical school describes itself as an institution maintained in the interest of the poor boy, and, secondly, as an institution devoted to the training of the country physician. If one reads the catalogs of these institutions, one can easily believe that in the commercial medical school as in no other institution the interests of the poor boy and of the resident of the country are deeply cherished. Both claims are without foundation. The poor boy pays as much money to go to a commercial medical school as he does to a medical school conducted in the highest spirit. This has to be because the commercial medical school exists only on the fees which the students pay, notwithstanding the fact that those who conduct such schools expect their return in the by-products of the school rather than in the fees. The boy of limited means is too often tempted into such a school and discovers too late that the kind of education he receives is not that which enables him to deal with disease.

The argument of the commercial school that only by its existence can the country side be settled with physicians is clearly misleading. The very idea is abhorrent to all sense of social justice. Are we deliberately to create a situation in which the men and women who live in the country are to accept an inferior type of medical practitioner? Is our civilization so constituted that we must provide one class of practitioners for the city and another for the country? As a matter of fact there is absolutely nothing in this contention. It is true that the graduates of the strong medical schools and of the weak medical schools alike go in overwhelming numbers into the cities. It is equally true that the graduate of the good medical school goes to the little town and to the country wherever he can make a living. A most careful examination has shown that a physician of the best training can be secured in any village or country-side where the practitioner of medicine can earn even a modest living. If there were being turned out from the medical schools only men rightly trained in some proportion to the number of places available, one can foresee the time when all places which could furnish a moderate living to the physician could be supplied. There are parts of our country so sparsely settled that no practitioner of medicine, whether well-prepared or ill-prepared, could make a living. For such a situation, a solution of a different kind must be found, and this is one of the problems with which the public health service of the state will in the long run deal. The fear that the country would be bereft of doctors if the inferior medical schools were abandoned is one of the singular theories, founded partly on lack of knowledge of the situation, partly on the assertions of those directly interested in keeping alive such schools.

One has only to recall the way in which young men come into the practice of medicine to realize the hollowness of the statement. The country or village doctor is in nearly all cases the neighborhood boy—often times the son or the nephew of the resident practitioner. He gets his preliminary education in the neigh-

borhood and goes off to the medical school and returns to take up the practice gradually being given up by his elders. The question whether he goes to a poor school or a good one has little to do with his return.

I venture also to say one word of the significance to the state and to the public health service of an educated profession of medicine. No method has been devised in our country or on the other side by which unfit men can be excluded from the profession of law, of medicine, or of the ministry, or of any other great profession, but the experience of the older country shows that there is one condition which can be imposed which does more than all others to bar out the unfit and the unworthy, and that is the standard which is imposed by the demand for a high order of preliminary education. No other condition can be imposed which will in the long run bring together so unselfish, so skilled, so devoted a class of men into a profession as the demand for a good preliminary education. Among our American communities this demand also has been looked on as somewhat undemocratic, an argument which has been used with the greatest possible effect by the commercial medical school. As a matter of fact, there is nothing undemocratic in such a demand. The right to practice medicine is not one into which a man is born. It is a right conferred on him by the state under such conditions as the state may fix. There is no condition which the state can make which in the long run will bring into the service of the profession and of the public, physicians of such high order as the requirement that they shall be, first of all, educated men, and the influence which the profession itself will have on the public will never attain its right proportions until such a condition has been accepted.

Looking forward then to the history of medicine in your commonwealth for the next decade, one can well believe that the conservation of the public health will be one of the chief functions of the state, that this work will be carried out by an organization so planned that all its factors may cooperate freely and heartily, and that the very center of such organization, furnishing to it the life-blood of devotion, of enthusiasm and of high endeavor, will be the state school of medicine, where practitioner and teacher, where student and investigator mingle together in an atmosphere which is charged not only with scientific skill, but also with the highest conceptions of patriotism.

Safe Drinking-Water.—Allen J. McLaughlin in *Public Health Reports*, June 26, 1914, says that there is a tendency in America to accept any raw water, however bad, as a source of supply for a municipal filtration-plant. This places an unreasonable burden on the filtration-plant, which not only depends on proper mechanism, but which also must be operated under careful bacteriologic control and is subject to the results of human error. While properly constructed filter-plants can produce safe water from bad raw water, especially by the use of hypochlorite or liquid chlorin, the responsibility of effecting such purification every hour of every day in the year is unreasonable and unfair, and raw water demanding such extraordinary treatment, constitutes a constant threat of disaster. There is no margin of safety under such conditions, and raw water should be furnished of such character that a plant can turn out safe water without the aid of chemical germicides. This would reserve chlorination as an additional margin of safety for use in extraordinary fluctuations of the raw water or during accidents to the plant.

INSTRUCTION IN ROENTGENOLOGY

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The committee of the Deutsche Röntgen-Gesellschaft has submitted its report on instruction in medical roentgenology in the German higher institutions, this report has been sent to the medical faculties of the German-speaking higher institutions of Germany, Austria and Switzerland, and it has also been published.¹ Some parts of it have been taken from data collected by Klingmüller, Kienböck, Holzknicht and Kreuzfuchs, and published in Volume XIX of the *Fortschritte*.

After calling attention to the rapid advances made in Roentgen science during a decade and a half, and to the utilization of this science by nearly all other branches of medicine, the report says:

Therefore, if complete medical training is to be secured in the universities, it is quite essential that there be the possibility of obtaining a systematic knowledge of roentgenology.

It is from this point of view that the Deutsche Röntgen-Gesellschaft has undertaken to direct the attention of the medical faculties of the various German-speaking institutions to the necessity of thorough instruction in roentgenology, and to the desirability of having the fostering cooperation of the universities in future research in this field.

The report summarizes the results of the "unwearied work of doctors and physicists" in the few years in which the x-rays, that is, the unknown rays, have been subjected to investigation. This work has made roentgenology an "independent specialty," which has both manysidedness and also oneness. Just as the fact that no physician can dispense with a knowledge of internal medicine does not exclude the need of specialization in internal medicine, so the utility of some insight into Roentgen procedures on the part of the general practitioner does not nullify the advantages of specialization in roentgenology. This specialty requires in a marked degree a broad and deep foundation in general medicine and the other specialties. Even in these few years, the Roentgen technic has become complicated and hence difficult, whether used for diagnostic or therapeutic purposes. Some of the injuries that a false therapeutic technic may cause have already been found out. To have any real value, both the fluoroscopic examination and the making of plates must be carried out with accurate technic, and the interpretation must be made with good knowledge of the sources of possible errors. Faulty, or even moderate, Roentgen technic is ineffective, and may be injurious.

To quote a few sentences from this report:

The erroneous idea that one needs only to be well versed in general medicine, in order to be able to interpret a Roentgen picture, is even to-day too wide-spread. Only on the basis of a many-sided experience gained by earnest study continued for years is it possible to analyze correctly that which is seen, and then, to interpret it, and to separate the essential from the non-essential. The interpretation of the

1. Der Unterricht in der medizinischen Röntgenologie auf den Deutschen Hochschulen, *Fortschr. a. d. Geb. d. Röntgenstrahl.*, Hamburg, 1913, xxi, 245.

Roentgen picture, therefore, requires knowledge which embraces almost the entire field of medicine and a good part of physics, and in addition a fundamental special experience. This is demonstrated also by the frequently observed fact, that many a specialist in another branch, who was using roentgenology in his specialty, finally either devoted himself entirely to roentgenology, or, if he remained true to his own subject, was no longer able to follow the advances of roentgenology. To master simultaneously and completely roentgenology and another specialty is in general impossible. The field of roentgenology has already become too great for that.

It was in view of such facts as these that the Deutsche Röntgen-Gesellschaft (with 609 members, almost nine-tenths of whom are active roentgenologic physicians) at its eighth congress, 1912, unanimously adopted the following resolutions:

1. Roentgenology is a fully justified medical specialty.
2. The roentgenologist is a specialist, and as such, and in accordance with generally accepted usages, is consulted by physicians or patients for the making or the verification of a diagnosis.
3. The roentgenologist, in addition to general clinical methods, makes use of the Roentgen procedure. He decides which procedure (photograph, fluoroscopic examination, orthodiagraphy, teleroentgenography, etc.) should be used.

This consensus of opinion has led to the expression of a desire that "in accordance with the ever-increasing importance of roentgenology this specialty henceforth be taught in the higher institutions by its own representatives, by a lecturer with this as his main line who receives a teaching appointment for this specialty."

The details of the report on the existing instruction in roentgenology in the German-speaking higher institutions might not be pertinent at this distance. But the conclusion drawn from these data is that this instruction is not now adequate, that roentgenology is not being taught to an extent consonant with its importance. At present almost the only available way for a physician to orient himself in the general field of roentgenology is to itinerate from one factory to another for certain phases of the subject, and from one clinic to another for others. The fact is emphasized that this situation does not accrue to the interest of this specialty or to that of medical science as a whole. The entire subject in all its multiplying ramifications should be transferred to the universities, and teaching should be done by specially prepared instructors. The retention of Roentgen outfits already in use in connection with the several specialties is contemplated, but in correlation and cooperation with the central roentgenologic department. The anticipated resultant advantages to all are great. Medical roentgenology will be taught where all other branches of medicine are taught—in the universities. Each of the other specialties need teach only such parts of roentgenology as pertain directly to its work. The Roentgen specialists themselves "constantly can test out the newly created methods of the restlessly advancing technic, before the clinics squander time and money on them; further, in difficult cases they can assist the physicians of the other clinics technically and scientifically; they can support the proficient with expert advice, and, above all, enlarge the scientific work of the specialty, as well as prepare a secure place for roentgenology in academic instruction."

The report also notes that, if it is granted "that every physician entering practice must have at his dis-

posal a certain but not too limited degree of systematic information about roentgenology," then "there follows also the necessity of taking account of this requirement in state medical examinations."

The positions taken regarding instruction in roentgenology by these compatriots of Roentgen seem justified by the facts presented. This being granted, these positions may be considered as applicable as fully to this country as to the countries for which they were originally formulated.

This report has led us to a study of the roentgenologic instruction in the United States. For this purpose has been chosen the list of the "A plus" group of medical colleges as given in THE JOURNAL of the American Medical Association, August 23, 1913, p. 585. The latest catalog (that is, the publication representing the teaching work of 1912-1913 or the announcements for 1913-1914) of each of these institutions has been carefully examined for information regarding instruction in roentgenology of whatever quality or quantity. Only a summary of the details of this compilation will be given here:

1. *Titles Used in Designating This Instruction.*—The terms used in referring to the subject are, actinography, radiography, radiology, roentgenology, Roentgen ray and x-ray, with more institutions using the word "roentgenology," than any other one term. This is also the word adopted in Germany. Of the institutions whose catalogs furnish any data, two have professors of this one subject, two have an associate professor for this and another specialty combined, two have an instructor for roentgenology; two, a lecturer; one, a demonstrator, and some of these have assistants in addition; five recognize positions of varying titles in connection with some hospital: all of which tends to show that up to the present time there has been no standardizing of the position of the teacher of roentgenology in American medical colleges.

2. *Roentgenology as a Distinct Department of Instruction.*—Four institutions—Northwestern University, Harvard University, Cornell University and the University and Bellevue Hospital Medical College—recognize roentgenology as a distinct department of instruction coordinate with the other medical specialties. In those institutions in which a course in roentgenology is offered but in a subordinate relation to some previously existing department, there is no uniformity as to the department with which it is incorporated.

3. *Year in Which Instruction in Roentgenology is Offered.*—Concerning the institutions whose catalogs furnish any data, the facts are: undergraduate course, required, in second year, 1; in third year, 2; in fourth year, 6; in third and fourth years, 1; undergraduate course, elective, in fourth year, 1; graduate course, 1.

4. *Number of Hours of Undergraduate Instruction in Roentgenology, and Character of Instruction Whether Didactic or Laboratory* (exclusive of use of plates to illustrate work in other subjects).—Concerning the institutions whose catalogs furnish any data, the facts are: *Didactic*, instruction given but hours not stated, 4; "all day throughout the year," 1; 9 hours, 1; 11 hours, 1; 16 hours, 2; 17 hours, 1; 30 hours, 1;—*laboratory*, "elective," 1; instruction given but hours not stated, 1; 40 hours, 1; 51 hours, 1.

The self-evident conclusion from this study of the official catalogs of the medical colleges in the "A plus" group is that in about one-third of them instruction in roentgenology is omitted altogether, and that in the

others it has no standardized status. Further, this being the case in the highest group, it is fair to infer that still less instruction in this subject is given in the other groups. Therefore, it becomes apparent that the opportunities in this country for the systematic study of medical roentgenology are very meager.

Yet the Council on Medical Education of the American Medical Association enumerates "Roentgen-ray apparatus" among the "essentials of an acceptable medical college," and the Association of American Medical Colleges in its "proposed minimum standard for clinical equipment," says, "Adequate rooms and equipment must be provided for x-ray work and for electrotherapeutics." Highly complicated technical apparatus certainly implies technical instruction in its use, its limitations and its dangers.

As a branch of medicine, roentgenology is in touch with all other branches of medicine. Although it is associated more closely with some of them than with others, experience has demonstrated its possible service to the other medical specialties, and the growing dependence of these specialties on roentgenologic findings. Roentgenology is a new science but it has already made contributions of value. In view of the extensive and increasing applicability of the Roentgen rays both in diagnosis and therapy, has the time not fully come when some adjustment should be made in American medical colleges which will give to roentgenology its logical place in medical instruction and research? If it is not taught systematically, how can the best results be obtained in actual practice? Can any American medical college otherwise well-equipped afford to ignore it? Does roentgenology not deserve a definite status in the medical curriculum?

PUBLIC HEALTH WORK AS A CAREER*

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The medical profession has always made a strong appeal to young men of fine character, as offering a career unsurpassed in opportunities for real human service. It is essentially that type of profession. To-day, with the rapid development of the science of preventive medicine, the opportunities are still greater, and the appeal to young men of high aims stronger than ever before. Particularly is this true in the comparatively new field of public health service.

This is the day of the efficiency expert. The public health officer is an efficiency engineer in the most important department of human life—good health. He is a constructive searcher after truth. Instead of tamping and patching up the machinery here and there, he builds anew. He has to know the whole works, not merely one process; he deals with society as a whole, instead of with a few separate units. Translated into the terms of his calling, his task is to keep all the people well and strong, instead of concerning himself only with the unfortunates who come to him in dire necessity. Economically, he is a wholesaler, free and unrestricted in his operations, dealing in a commodity everybody wants, rather than a retailer with whom, generally speaking, nobody really wishes to do business. He is the servant of the community, tied to no

man, but free to do his duty as he sees it, whether that duty be to purge a Cuba of yellow fever, clean a pestilential Panama, or wipe out the double scourge of hookworm and typhoid from some rural community. The public health officer is dependent for his material rewards, not on haphazard personal fees, but on the good faith of a public which is fast learning to pay adequately for adequate service by experts.

For a young man on the threshold of his career, however, there are certain very practical points to be considered. At least three questions may be asked by any vocation, whether it be public health work, private medical practice or any other. First, what are the immediate chances of employment? Second, what is the compensation? Third, is the work sufficiently permanent in character to warrant giving one's life to it? These three questions are fundamental. How does the field of public health work measure up to them, especially when compared with that of private practice of medicine?

It may be stated with full assurance at the outset that there are already more positions open for trained health officers than can be satisfactorily filled. The demand is increasing all the time. It comes from federal, state and city health departments; from the International Health Commission and similar quasi-public health agencies; from the schools, and more recently from rural counties. Medical inspection of schools has made rapid strides in the last year or two, both city and county. Twenty-one states now have medical inspection laws, ten of which are mandatory; while in many of those states without special laws on the subject many individual cities have inaugurated medical inspection systems. The medical inspection work is more and more being centered about the whole-time health officer. Maryland is looking for men to fill positions created by the sanitary district bill passed at the last legislature. New York State is in the market for a large number of trained health officers. North Carolina employs eleven whole-time county health officers at salaries that attract capable men irrespective of residence. Sooner or later all the states will exert that control over hygienic and sanitary conditions which a few now exert, and this will mean an ever-increasing demand for public health officers to give their entire time to the community. Already some of our educational institutions are coming forward with special courses to train men for the new work—the "School for Health Officers" of Harvard and Massachusetts Institute of Technology is sufficiently well known; and at least five American universities—Harvard, Pennsylvania, Michigan, Wisconsin and Tulane—now grant the degree of Doctor of Public Health for special public health work over and above the requirements for the regular medical degree.

With the increased demand for trained health officers has come higher compensation for such work. Specially trained men are commanding salaries much more nearly adequate than in the past. In the days of political appointments the candidate for health officer was glad to get a small regular salary for a little of his time to supplement his always uncertain and frequently uncollectable private fees. With whole-time men engaged, better salaries come as a natural development. Already the salaries paid health officers compare more than favorably with the present incomes of private practice. Investigation has shown that, despite the large earnings of a few medical men, the average

* Address delivered at the Commencement Exercises of the Medical College of Virginia, Richmond, June 2, 1914.

salary for a physician in the United States is between \$800 and \$1,200.¹ In New York City the salaries of health officers range from \$900 to \$1,500, but this amount is felt to be so little that the physicians are allowed to take some outside practice. Salaries of school medical inspectors in twelve cities enumerated by Dr. Heitmuller, of Washington, D. C., ranged from \$1,200 to \$2,000.² These figures do not include the administrative pay in public health work, which is of course much higher. Surgeon-General Blue, of the United States Public Health Service, notes that the municipalities are offering such good inducements that many of the men in his branch of the government are leaving the service to take positions as health officers, and he foresees a steady rise in compensation.

That salaries will continue to grow better in public health work is evident from an analogous development in another field in which what was once a private, individual matter has become a public function—that of education. When school superintendents were elective the pay was low and tenure insecure, and few thoroughly capable men were attracted to the profession. To-day the city school superintendent is one of the highest paid of municipal officers, and enjoys an independence of political affiliations that is the envy of other public officials. It happens that in the case of state and county school superintendents the process has not been completed; in some states partisanship has been entirely eliminated from the schools, and school officers are on a thoroughly professional basis; in others this is not yet the case. It is possible to look over the states and tell at a glance where the pay is high or low, according to whether the position is or is not political. New Jersey's commissioner of education is an educational expert who receives \$10,000 a year. His politics have never been inquired into; he was brought from a distant state because he was considered the best man for the position. Nebraska's state superintendent of public instruction, nominally with the same qualifications as New Jersey's commissioner, is elected on a party ticket. He is paid \$2,000 a year. The county superintendents in the six to nine hundred dollar class are for the most part in states that have not yet fully accepted the scientific attitude toward expert public service; the \$3,000 county superintendents are in states that have learned, as all will soon learn, the basic economy involved in high pay for expert service.

What has taken place in the field of education is taking place just as definitely in the field of public health work. More enlightened public sentiment with regard to medical standards is removing the health officer from politics and increasing his pay to a point at which well-trained men are sought and obtained for the work.

To ask if public health work will be permanent is to ask whether good health will always be desired and whether community spirit will grow. The public health officer need not fear for employment; he is a necessary factor in progress. His field, dependent as it is on community good health, rather than individual ill health, will grow ever more important as prevention replaces treatment in the handling of disease. The young man inclined to choose between private practice and public health work would do well to bear in mind the essentially permanent character of community

health service, unaffected by the many temporary conditions that make or unmake opportunities in the field of private practice.

One thing is certain. The field of public health work is no place for the poorly trained medical man. Medical men are needed for health work, but only highly trained medical men. The public is going to employ more and more health officers; it will be liberal in its compensation, but it will insist on men specially equipped for the work. At present it is difficult to get the precise training that is needed. The universities and medical schools are just beginning to awake to the supreme importance of positive health work in the community as compared with mere negative combating of disease. The health officer should have something that will do for his future work what the hospital does for the ordinary medical man. In default of other agencies to provide this special preparation, new agencies will have to be devised; and pending this, promising young men who have completed the regular medical course in the institutions of higher grade should be selected to serve an apprenticeship under trained health officers in actual service, both in the field and in the administrative offices.

Once get the idea of the trained health officer at his work, mapping a community, surveying it with a view to sound principles of sanitation and inspiring the citizens with the ideals of healthful living, and it does not require a much greater flight of the imagination to see this work of survey, prevention and health-teaching done everywhere—in all local communities, under county supervision; in all counties, under efficient state supervision, and all states under efficient national supervision. One might go a step further and picture a broadly organized international health organization, making a survey of the leading nations, taking the best to be found in the experience of the different nations and setting up standards for all the nations to attain. All this may seem too far afield; or at least too remote for men now living; but it does not seem so impossible of realization when we consider the other scientific achievements of our day, in medicine itself, if you please; and a vision like this will in any case serve to reassure those who may enlist in this war that it is not a war of a day, or even of a generation, but a permanent indispensable service to society.

There appears to be some danger that the public health work may to some extent escape the control of those most competent to direct it—the medical profession. This is emphatically a movement in which leadership belongs to the trained medical man. The lay sanitarian, no matter how efficient he may be in his own particular line, cannot wholly take the place of the physician, with his peculiarly valuable background of education and human experience. As routine medical treatment yields before preventive medicine, readjustment will have to take place; but I believe that readjustment is nearer than many of us realize; and I have sufficient faith in the men of my profession to believe that in large measure this readjustment will come from within. Something like it is already taking place in England, where the community ideal has recently gone forward by leaps and bounds. The spirit certainly exists among medical men in the United States. Does not the constitution of the American Medical Association recite that its aim shall be the "enlightening and directing of public opinion in regard to the broad problems of hygiene"? And the corresponding section of the constitution of the North

1. *Pennsylvania Med. Jour.*, 1901-1902, v, 362.
2. From unpublished memoranda.

Carolina State Medical Society goes even further in acknowledgment of the public health aim of the medical profession—it not only urges the extension of medical knowledge, better standards of medical education and “the enlightenment and direction of public opinion in regard to the great problems of state medicine,” but urges as the motive for this “that the profession shall become more capable and honorable within itself, and more useful to the public in the prevention and cure of disease and in adding comfort to life.”

Surely no richer field of labor can be conceived of than that of public health work. The medical man has always stood for something a little more than just his profession; as confidant, as valued counselor in time of trouble, as the keeper of family secrets, he has played the rôle of an idealist in human history. Add to these individual and personal attributes of the old-time physician the ideals of the health officer in his social service of to-day, of positive effort in behalf of all his fellowmen, and you will produce a band of men who will indeed be valued guardians of the outposts of civilization.

THE VALUE OF THE MEDICAL COLLEGE LIBRARY TO THE STUDENT*

CHARLES FRANKENBERGER

Librarian, Jefferson Medical College

PHILADELPHIA

Only in recent years have medical colleges realized the value of a medical library as an essential part of the college equipment. Medical students two decades ago were without the help of a medical library; they had to be content with a case of books, largely obsolete, in a corner of some out of the way room. A student in those days was expected to do his reading in his preceptor's library. Often older graduates, on visiting our library, have said to me, “We didn't have anything like this when I was a student.”

A modern medical library, in charge of an experienced librarian, is one of the requirements of the Council on Medical Education of the American Medical Association. To receive recognition as an acceptable medical college, “The college should have a working medical library to include the more modern text and reference books with the ‘Index Medicus’ and thirty or more leading medical periodicals; the library room should be properly lighted and heated, and easily accessible to students during all or the greater part of the day; it should be equipped with suitable tables and chairs, and have a librarian in charge.”

The maintenance of a well-equipped medical library as a part of the medical school or college has a number of advantages. In the first place it is a convenience to the students in that it makes it unnecessary for them to carry about a number of their own text-books to which they might wish to refer. The library, however, is not intended to take the place of the students providing themselves with such books as they should have for their own use in their homes. Some students are not in a position to supply themselves with all the necessary text-books required, and for these the library provides an aid much desired and appreciated. Were it not for the library facilities, these students

would be compelled to follow such notes as they could take in the lecture room and clinic. The instruction so acquired would satisfy those students who were simply bent on gaining sufficient knowledge to pass their examinations. They would not, however, have the broader knowledge and culture obtained by the students who supplemented their lectures and clinics by reading the fuller accounts in the various standard text-books and systems, as it is not possible for any teacher to cover in detail in the time allotted the many subjects of his particular branch of medicine as fully as it is given in an authoritative text-book. It is necessary for the student, while in college, to confine himself to certain text-books and instruction of his teachers, but by reading he can become familiar with the opinions and methods of other authorities which it would be well for him to know, not so much for use during his medical course, but as a broader knowledge for use in his future professional career.

Another advantage of the medical college library and a comfortably equipped and attractive reading room, easily accessible, well-lighted and heated, is that it encourages the student to use the library during his odd moments instead of wasting his time on the streets or elsewhere.

Possibly the greatest advantage of such a library is that it places about the student an environment which has a tendency to inspire in him a desire to read and become acquainted with the literature of his profession so freely available. It gives the student the opportunity to keep in touch with the literature in the more important current medical periodicals, and to become acquainted with the recent books and monographs on special subjects. If there is only time to look hastily through them and to become sufficiently familiar with them to know that such a work has been written on that particular subject, it will be valuable knowledge that will prove helpful at some future time.

To cultivate in the student the habit of reading in the odd moments and spare time of his medical course is to be encouraged and fostered in every way, for the possession of such a habit after entering on practice will be of inestimable value to him. It is safe to say that many who do not acquire this habit during their college career never attain it after graduation.

The great difficulty in endeavoring to encourage the acquiring of this habit by the student is the very limited spare time allowed in our already crowded curriculums.

The teacher who is himself thoroughly familiar with the literature of his profession can accomplish a great deal in the way of creating in the student an interest in seeking further information and knowledge by referring in his lectures and clinics to the masterpieces of medical literature, or to the biographies of those to whom the medical profession is indebted for their pioneer work or achievements in medicine and surgery. He can refer his students to the originals of articles which present results of experiments or investigations that have proved epoch-making. This avoids the necessity of the student investigator using his limited time to wade through a lot of valueless and ephemeral literature in order to find these masterpieces of scientific research.

Dr. Thomas McCrae of our faculty has followed the plan of assigning to certain students the preparation of a brief biography of those on whose experiments and investigations have resulted the foundation

* Extract from a paper read at the seventeenth annual meeting of the Medical Library Association, Atlantic City, June 22, 1914.

principles of some of our progress in medicine. These biographies are read by the student before the class prior to the lecture on the particular disease or subject at hand, and are made more interesting by the additional remarks that may be made by the teacher.

It is a regrettable fact that the great majority of our medical students graduate and pass out of the medical college and enter on their professional careers with practically no knowledge of how to obtain the literature on a particular subject should they wish to prepare a paper or to do research work. They do not have the least idea where and how to look up references and that such references even exist outside of their text-books. They know practically nothing of the value and contents of the "Index Catalogue" and the "Index Medicus" or how to use them. Of course they have had little or no occasion to refer to these during their college course, but it seems to me that every graduate in medicine should be familiar with these publications and know how to use them.

Would it not be well for our medical colleges to provide somewhere throughout the course in medicine an opportunity for instruction in the use of the various indexes and bibliographic reference works so valuable to the medical writer and investigator? Could not this instruction best be given by the one most familiar with the subject, the librarian in each institution?

This instruction would include the explanation of the use of the card catalogue of the local library, the contents, arrangement, mode of using to obtain the information desired in the least space of time and in the most thorough manner, of the various bibliographic indexes such as the "Index Catalogue of the Library of the Surgeon-General's Office," the "Index Medicus," the various year-books, annuals, *Jahrbücher* and *Jahresbericht*; where and how to find abstracts, as in the "Current Medical Literature" section of *THE JOURNAL* of the American Medical Association and the *International Abstract of Surgery* and the various *Centralblätter*; and information as to how to obtain publications from the Library of the Surgeon-General's Office in towns where there are no medical libraries or where the library does not have the desired books. All this and much more helpful information might be given in such a talk.

While the student would not recognize the value of such instruction while in college he would readily appreciate it when entering on his medical literary work.

Would not the "knowing how" thus acquired by the student be an impetus to him in the preparation of any papers that he may wish to write or in doing reference work for others?

When a student has fully realized the value of a library, when he has learned the relative value of the literature of medicine and has become acquainted with the various methods of bibliographic work and the use of library facilities, he has laid a literary foundation that will be an efficient means in acquiring a better medical education and a broader medical culture.

It is hoped that the foregoing will impress on those in authority in our medical colleges the essential value of the medical library to the institution and especially to the students, and help to inculcate in the student a greater desire to avail himself of the abundant opportunities afforded for the widest possible knowledge to be acquired in his chosen profession.

Tenth and Walnut Streets.

FOREIGN BODIES IN THE BLADDER.

LOUIS GROSS, M.D., SAN FRANCISCO.

While the literature teems with interesting cases of foreign bodies in the bladder, the first case here recorded is unique in many respects and should teach us a few valuable facts.

C. K., of San Bernardino, Cal., hotel proprietor, was referred to me with the following history: Family history was negative. Patient had some difficulty in urination, for the relief of which a suprapubic prostatectomy was done, June 27, 1912. Following the operation the patient had two postoperative hemorrhages; suprapubic drainage was removed three weeks later; patient urinated through the urethra from five to six weeks after operation; bladder wound closed in the ninth or tenth week. Patient consulted Dr. George K. Herzog, June 16, 1913, almost one year later, and was immediately referred to me. His history was one of continued frequency of urination, nocturnally and diurnally, tenesmus, and stinging pain at glans penis. Urinary examination showed turbidity, acid reaction, 1.030, no casts, many red blood-cells, no crystals, and a few spherical epithelial cells. Cystoscopy showed a calculus in the bladder.

June 19, litholapaxy was done and a large amount of fragments was removed with the evacuator. Patient also passed a considerable number through the urethra. As not all were crushed in the one sitting, June 21, Nitze's operation-cystoscope with lithrotite attachment was used; as operation became too painful, nitrous oxid-oxygen anesthesia was given. Many small fragments were broken and then a foreign substance was caught in the jaws of the instrument, which was also attached to the bladder wall at the site of the previous prostatectomy. A suprapubic cystotomy was then performed and what was thought, when observed through the operation-cystoscope, to be a piece of gauze, proved to be a piece of the ordinary soft-rubber catheter about 20 F. and about 1½ inches long. The catheter was attached to the wall of the bladder at the site of the former operation. Patient made an uneventful recovery. July 16, cystoscopy showed a normal bladder. This case is recorded to warn us of the great danger lurking in the use of deteriorated rubber drainage-tubes, to urge the testing of all tubing before insertion into the bladder, the avoidance of tubing too small in caliber, and to examine all cases of this character cystoscopically as a control.

A physician called on me one morning much disturbed and related the following interesting story: A patient of his had a stricture of the urethra which could not be passed by sounds of ordinary size. After the use of all the smaller sizes of exploratory bougies he used a filiform, succeeded in entering and immediately passed a Gouley tunneled sound. During this manipulation the filiform suddenly slipped beyond his reach and entered the bladder. I informed him that a stricture admitting only a filiform would not allow the passage of an operation-cystoscope for its removal; furthermore if he would wait a few days the filiform would pass out. Being obdurate to this plan of procedure, the patient was brought to my office the same afternoon. Various sounds were tried without success until I changed my position from the right to the left side of the patient. This is a method we should take note of, as often the tip of the sound will be caught in a pocket and the shifting of one's position from left to right or vice versa will cause supposed strictures to disappear immediately.

With the Buerger operation-cystoscope and with a long pair of Buerger forceps passed through this instrument, the edge of the filiform was grasped and removed through the instrument. I may state here that in the removal of filiforms, it is necessary to grasp the filiform at either thin end and not in the thick center.

This case teaches us the necessity in the treatment of filiform strictures of exercising great care in grasping the filiform with a pair of hemostatic forceps as soon as the Gouley tunneled sound or catheter is passed over the filiform; otherwise it may be carried into the bladder.

45 Kearny Street.

MEDICAL COLLEGES OF THE UNITED STATES

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ANNUAL PRESENTATION OF EDUCATIONAL DATA BY THE COUNCIL ON MEDICAL EDUCATION

Below are given brief descriptions of the medical colleges in the United States and Canada that are legally chartered to teach medicine, several of which do not grant degrees. The name, address, year of organization, history and date when first class graduated are given in each instance. Unless otherwise stated, a class graduated each subsequent year. Where official reports have been received from the college, information regarding faculty, entrance requirements, length of term, fees, students (excluding specials and postgraduates), graduates, name of dean and next session is given without discrimination, regardless as to whether the college is sectarian or not. In a few instances in which such reports were not received the information published is from other reliable sources. Figures for graduates include all who graduated since July 31, 1913. Extracts of rules and the membership of the Association of American Medical Colleges are shown following the list of colleges. Figures showing population of cities and states are taken from the United States Census Bureau's returns for 1910. Statements have been added showing the preliminary requirements held by state licensing boards where those requirements include one or two years of collegiate work.

ALABAMA

Alabama, population 2,138,093, has two medical colleges, the School of Medicine of the University of Alabama and the Birmingham Medical College, located, respectively, in Mobile and Birmingham. The population of Mobile is 51,521 and of Birmingham 132,685.

In order to secure licenses to practice medicine in Alabama, students matriculating in the session of 1915-16 and thereafter, must have completed *two years* of work in an approved college of liberal arts including courses in physics, chemistry, biology and a modern language prior to entering on the study of medicine.

Birmingham

BIRMINGHAM MEDICAL COLLEGE, Avenue F and Twentieth Street. Chartered in 1894. The first class graduated in 1895. In 1913 became the Graduate School of Medicine of the University of Alabama. There are 19 professors and 13 assistants, total 32. The course of undergraduate instruction now embraces one session of eight months. Only seniors will be enrolled. When this class has graduated, the college will cease to do undergraduate teaching. The fees are \$130. The secretary is Dr. E. P. Hogan. Registration, 1913-14, 57; graduates, 30. The twenty-fourth session begins Oct. 1, 1914, and ends May 28, 1915.

Mobile

UNIVERSITY OF ALABAMA SCHOOL OF MEDICINE, St. Anthony and Lawrence Streets. Organized in 1859 as the Medical College of Alabama. Classes were graduated in 1861 and in all subsequent years except 1862 to 1868, inclusive. It was reorganized as the Medical Department of the University of Alabama in 1897. All property was transferred to the present, one year and, for the session of 1915-16, *two years* of college work will be required for admission. The faculty consists of 14 professors and 41 lecturers and assistants, a total of 55. The course of study covers four years of thirty-two weeks each. The total fees for each of the four years, respectively, are \$160, \$155, \$155 and \$175. The Dean is Dr. Eugene D. Bonduant. The total registration for 1913-14 was 94; graduates, 21. The forty-ninth session begins Sept. 24, 1914, and ends June 9, 1915.

ARKANSAS

Arkansas, population 1,574,449, has one medical college, the Medical Department of the University of Arkansas, located in Little Rock, a city of 45,941.

To secure licenses to practice medicine in Arkansas, students matriculating in the session of 1915-16 and thereafter must have completed at least one year of collegiate work including college courses in physics, chemistry, biology and a modern language before beginning the study of medicine. This applies to all graduates of 1919 and thereafter.

UNIVERSITY OF ARKANSAS MEDICAL DEPARTMENT, Markham and Center Streets. Organized in 1879 as the Medical Department of Arkansas Industrial University. It assumed the present title in 1899. In 1911 the College of Physicians and Surgeons united with it and the new school was made an integral part of the University of Arkansas. The first class graduated in 1880. The faculty consists of 15 professors and 36 lecturers and assistants, total 51. Entrance requirements will be increased to include a year of collegiate work beginning with the session of 1915-16. The fees are \$125 for each of the first three years and \$150 for the fourth year. The Dean is Dr. Morgan Smith. Total registration, 1913-14 was 95; graduates, 34. The thirty-sixth session begins Sept. 14, 1914, and ends May 13, 1915.

CALIFORNIA

California, population 2,337,459, has eight medical colleges. Four are located in San Francisco, a city of 416,912 inhabitants. They are Leland Stanford Junior University School of Medicine, College of Medicine of the University of California, Hahnemann Medical College of the Pacific and the

College of Physicians and Surgeons. The College of Physicians and Surgeons and the California Eclectic Medical College are situated in Los Angeles, population 319,198. The Oakland College of Medicine and Surgery is in Oakland, population 150,174. The College of Medical Evangelists is located at Loma Linda, a village of 110 people.

To secure licenses to practice medicine in California under the "physician's and surgeon's" certificate, students matriculating in medical colleges in and after the session of 1915-16 prior to such matriculation must have completed at least one year of recognized collegiate work including college courses in physics, chemistry, biology and a modern language. This applies to all graduates of 1919 and thereafter.

Berkeley-Los Angeles-San Francisco

UNIVERSITY OF CALIFORNIA COLLEGE OF MEDICINE, University Campus, Berkeley. Second and Parnassus Avenues, San Francisco. Organized in 1863 as the Toland Medical College. The first class graduated in 1865. In 1872 it became the medical Department of the University of California. In 1909 the College of Medicine of the University of Southern California, at Los Angeles, by legislative enactment, became a graduate department. This Los Angeles portion was changed to a work of the last two years at San Francisco. The faculty is required for 21 professors and 55 associates and assistants, a total of 76. The course covers four years of nine months each. Fees for the four years respectively are \$195, \$180, \$165 and \$165. The Dean is Dr. Herbert C. Moffitt, San Francisco. Total registration for 1913-14 was 124; graduates 18. The forty-second session begins Aug. 7, 1914, and ends May 8, 1915.

Loma Linda

COLLEGE OF MEDICAL EVANGELISTS.—Organized in 1909. The faculty over five years of nine months each, but includes a study of the Bible and evangelistic training—non-medical subjects. The total fees each year are \$136; matriculation fee, \$5, payable but once; graduation fee, \$10. The Dean is Dr. Alfred Shryock. The total registration for 1913-14 was 75; graduates, 6. The sixth session begins Sept. 13, 1914, and ends June 8, 1915.

Los Angeles

COLLEGE OF PHYSICIANS AND SURGEONS, 516 East Washington Street. Organized in 1903, first class graduated in 1905; became Medical Department, University of Southern California Aug. 11, 1909. The course covers four years of nine months each. One year of collegiate work is required for admission. The faculty consists of 19 professors and 59 associate professors, lecturers and instructors, a total of 78. The fees for the four years respectively are \$177, \$172, \$160 and \$175. The Dean is Dr. Charles W. Bryson, Delta Building, Los Angeles. The registration for 1913-14 was 153; graduates 34. The next session begins Sept. 9, 1914, and ends June 10, 1915.

CALIFORNIA ECLECTIC MEDICAL COLLEGE, 846 Lyon Street. Organized in 1879 at Oakland as the California Medical College. Removed to San Francisco in 1887. Suspended in 1906. Reorganized at Los Angeles with the present title in 1907. Classes were graduated in 1880, and in all subsequent years except 1907. The registration for 1913-14 was 38; graduates, 11.

Oakland

OAKLAND COLLEGE OF MEDICINE AND SURGERY, Thirty-First and Grove Streets. Organized in 1900, opened in 1902. The first class graduated in 1906. The faculty numbers 44. The course covers four years of nine months each, and the classes are limited to ten students each. The total fees for each of the four years, respectively, are \$210, \$200, \$175 and \$175. The Registrar is Dr. Edward N. Ewer. The total registration for 1913-14 was 15; graduates, 3. The thirteenth session begins Aug. 18, 1914, and ends May 22, 1915.

San Francisco

HAHNEMANN MEDICAL COLLEGE OF THE PACIFIC, Homeopathic. Sacramento and Maple Streets. Organized in 1881 as the Hahnemann Medical College. The first class graduated in 1884. In 1888 it became the Hahnemann Hospital College of San Francisco. It assumed the present name in 1902. It has a faculty of 22 professors and 16 lecturers, instructors, etc., a total of 38. The course covers four years of thirty-four weeks each. Total fees for the first year are \$155, and \$100 for each of the other three. The Dean is Dr. James W. Ward.

391 Sutter Street. The total registration for 1913-14 was 40; graduates, 5. The thirty-third session begins Aug. 11, 1914, and ends April 29, 1915.

COLLEGE OF PHYSICIANS AND SURGEONS, 344 Fourteenth Street.—Organized in 1896. The first class graduated in 1897. The faculty numbers 24. The course covers four years of nine months each. The fees for each of the four years, respectively, are \$165, \$160, \$160 and \$185. The Dean is Dr. L. W. Spriggs. Registration for 1913-14 was 34; graduates, 8. The eighteenth session begins Sept. 2, 1914, and ends June 4, 1915.

San Francisco-Palo Alto

LELAND STANFORD JUNIOR UNIVERSITY, SCHOOL OF MEDICINE, University Campus, Palo Alto, and Sacramento and Webster Streets, San Francisco.—Organized in 1908 when, by an agreement, the interests of Cooper Medical College were taken over. The faculty consists of 36 professors and 57 lecturers, assistants, etc., a total of 93. Three years of collegiate work are required for admission. The course covers four years of nine months each. Students matriculating in September, 1914, and thereafter will be required to take a five year course including a year of practical or intern work prior to graduation. The total fees for the first are \$160; for the second, \$155 and for the third and fourth years, \$150 each. The Dean is Dr. R. L. Wilbur, San Francisco. The total registration for 1913-14 was 75; graduates, 13. The fifth session begins Sept. 2, 1914, and ends May 17, 1915.

COLORADO

Colorado, with a population of 799,024, has one medical college, the University of Colorado School of Medicine. The first two years of the course are given at Boulder, the seat of the university, while the last two, or clinical years, are given in Denver, which has a population of 213,381.

The Colorado State Board of Medical Examiners will register without further examination graduates of medical colleges in good standing who present licenses issued after examination granted by any other licensing board. The law permits any one, graduate or non-graduate, to try the Board's written examination. No graduate of 1914 or thereafter is eligible to obtain a license in Colorado on indorsement of his credentials unless he graduated from a medical college which at the time he matriculated required at least two years' study without conditions in an accredited college of liberal arts which work must have included courses in physics, chemistry, biology and one modern language.

Boulder-Denver

UNIVERSITY OF COLORADO SCHOOL OF MEDICINE.—Organized in 1883. Classes were graduated in 1885 and in all subsequent years except 1898 and 1899. Denver and Gross College of Medicine was merged Jan. 1, 1911, when the legal right to teach the last two or clinical years in Denver was secured. The faculty embraces 49 professors and 24 lecturers and assistants, a total of 73. The work embraces a graded course of four years of nine months each. The entrance requirements are two years of college work counting toward a degree in arts in an accredited college or university. The tuition is \$75 per year; there are no other fees. The Dean is Dr. William P. Harlow. The total registration for 1913-14 was 54; graduates, 17. The thirty-third session begins Sept. 14, 1914, and ends June 9, 1915.

CONNECTICUT

Connecticut, with a population of 1,114,756 has one medical college, located in New Haven, population 133,605.

Candidates for license to practice medicine in Connecticut, who graduate in 1914 or thereafter are not eligible unless, prior to entering on the study of medicine they had completed, in addition to an accredited four-year high school education, at least nine months of collegiate work including college courses in physics, chemistry and general biology.

New Haven

YALE MEDICAL SCHOOL, York and Chapel Streets.—This is the Department of Medicine of Yale University. In 1810 a charter was granted for the establishment of this school, and in 1813 it was organized as the Medical Institution of Yale College. The first class graduated in 1814. The faculty consists of 16 professors and 50 lecturers and assistants, a total of 66. The requirement for admission is two full years of collegiate work plus evidence of satisfactory preparation in physics, general inorganic chemistry and general biology. The course covers four years of nine months each. The fees for the four years, respectively, are approximately \$223, \$170, \$153 and \$163. The Dean is Dr. George Blumer. The total registration for 1913-14 was 49; graduates, 8. The one hundred and second session begins Oct. 1, 1914, and ends June 23, 1915.

DISTRICT OF COLUMBIA

Washington, population 331,069, has three medical colleges; George Washington University Medical School, Georgetown University School of Medicine and Howard University School of Medicine.

Washington

GEORGE WASHINGTON UNIVERSITY MEDICAL SCHOOL, 1325 H Street, N.W.—Organized in 1822 as the National Medical College, Medical Department of Columbian College. Classes were graduated in 1826 and in all subsequent years, except 1834 to 1838, and 1861 to 1863, inclusive.

The original title was changed to Medical Department of Columbian University in 1873. In 1903 it absorbed the National University Medical Department. In 1904, by an act of Congress, the title of George Washington University was granted to the institution. The faculty is composed of 22 professors and 51 instructors, demonstrators and assistants, a total of 73. One year of collegiate work is required for admission. The course covers four years of thirty-two weeks each. The total fees are \$150 per year. The Dean is Dr. William C. Borden. The total registration for 1913-14 was 171; graduates, 16. The ninety-third session begins Sept. 30, 1914, and ends June 9, 1915.

GEORGETOWN UNIVERSITY SCHOOL OF MEDICINE, 920 H Street, N.W.—Organized in 1851. The first class graduated in 1852. The faculty contains 33 professors, 54 instructors and assistants; total, 87. Two years of collegiate work are required for entrance. The course of study covers four terms of eight and one-half months each. The fees for the first year are \$165, and for each of the other three years, \$150. The Dean is Dr. George M. Kober. The registration for 1913-14 was 99; graduates, 21. The sixty-fourth session begins Sept. 25, 1914, and ends June 13, 1915.

HOWARD UNIVERSITY SCHOOL OF MEDICINE, Fifth and W Streets, N.W.—Chartered in 1867. Organized in 1869. The first class graduated in 1871. Colored students compose a majority of those in attendance. The faculty comprises 19 professors and 20 lecturers and assistants, 39 in all. The admission requirements are one year of collegiate work including physics, chemistry, botany and zoology and a reading knowledge of one modern language besides English. The course covers four years of thirty-two weeks each. The fees of each of the four sessions, respectively, are \$107, \$102, \$102 and \$109. The Dean is Dr. Edward A. Balloch. Registration for 1913-14 was 110; graduates, 32. The forty-seventh session begins Oct. 1, 1914, and ends June 2, 1915.

GEORGIA

Georgia, population 2,609,121, has two medical colleges; University of Georgia, Medical Department, located in Augusta, population 41,040 and the Atlanta Medical College, in Atlanta, a city of 154,839 population.

Atlanta

ATLANTA MEDICAL COLLEGE.—Butler and Armstrong Streets.—Organized in 1854. Classes graduated, 1855 to 1861, when it suspended. Reorganized in 1865. In 1898 it merged with the Southern Medical College (organized in 1878) taking the name of Atlanta College of Physicians and Surgeons. In 1913 it merged with the Atlanta School of Medicine (organized in 1905), reassuming its first title. One year of collegiate work is required for entrance. It has a faculty of 34 professors and 78 instructors, assistants, etc., a total of 113. The course of study is four years of thirty-two weeks each. The fees are \$150 each year. The Dean is Dr. W. S. Elkin. Total registration for 1913-14 was 488; graduates, 125. The next session begins Sept. 28, 1914, and ends June 1, 1915.

Augusta

UNIVERSITY OF GEORGIA, MEDICAL DEPARTMENT, Railroad Avenue and Harper Street.—Organized in 1828 as the Medical Academy of Georgia, the name being changed to the Medical College of Georgia in 1829. Since 1873 it has been known as the Medical Department of the University of Georgia. Entire property transferred to the University in 1911. Classes were graduated in 1833 and in all subsequent years except 1862 and 1863. The faculty includes 20 professors and 27 assistants, 47 in all. One year of collegiate work is required for entrance. The course is four years of thirty-four weeks each. Fees are \$150 each year. The Dean is Dr. W. H. Doughty, Jr. The total registration for 1913-14 was 58; graduates, 20. The eighty-third session begins Sept. 16, 1914, and ends June 1, 1915.

ILLINOIS

Illinois, population 5,638,591, has eight medical colleges, two of which give instruction at night, all located in Chicago, a city of 2,185,283 inhabitants, and are as follows: Rush Medical College, Northwestern University Medical School, University of Illinois College of Medicine, Hahnemann Medical College and Hospital, Bennett Medical College, Chicago College of Medicine and Surgery, Jenner Medical College and the Chicago Hospital College of Medicine.

To be eligible for license to practice medicine in Illinois, students matriculating in the session of 1914-15 and thereafter, in addition to an accredited four-year high school education, must have completed at least a year of collegiate work including courses in physics, chemistry, biology and a modern language, to be taken either in a preliminary year given by a recognized medical college, or in an approved college of liberal arts.

Chicago

RUSH MEDICAL COLLEGE.—This school was founded in 1837, organized in 1843, was the medical department of Lake Forest University from 1887 until 1898, when it became affiliated with the University of Chicago. The first class graduated in 1844. The faculty is composed of 100 professors, 188 associates, instructors, etc., a total of 288. The requirements for admission are two years of college work, including knowledge of college chemistry, physics and biology, and a reading knowledge of German or French. Classes are limited to 100 students in each of the freshman and sophomore classes and to 120 students in each of the clinical years. No application for admission is accepted after September 1. The course covers four years of eight and a half months each. A fifth year, consisting of a hospital internship or of a fellowship in one of the departments, will be required of all students matriculating for the summer quarter of 1914 and thereafter. All freshmen and sophomore studies are given at the University of Chicago. The clinical years are given in the building at the corner of Wood and Harrison Streets. The total fees are \$180 each year. A matriculation fee of \$5 is paid but once, and there are incidentals amounting from \$2 to \$5 annually. The

Dean is Dr. John M. Dodson. Total registration 1913-14 was 462; graduates, 97. The seventy-second session begins Oct. 1, 1914, and ends June 19, 1915.

NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, South Dearborn Street, between Twenty-Fourth and Twenty-Fifth Streets.—Organized in 1859 as the Medical Department of Lind University. In 1864 it became independent as the Chicago Medical College. It united with Northwestern University in 1869, but retained the name of Chicago Medical College until 1891, when the present name was taken. The faculty comprises 58 professors and 80 lecturers and assistants, a total of 138. The requirements for admission are such as will admit to the College of Liberal Arts of Northwestern University plus two years of college work including courses in physics, chemistry, biology and a modern language. The course covers four years of eight months each. The fees for the four years, respectively, are \$190, \$195, \$190 and \$206. The Dean is Dr. Arthur R. Edwards. The total registration for 1913-14 was 180; graduates, 69. The fifty-fifth session begins Sept. 29, 1914, and ends June 6, 1915.

UNIVERSITY OF ILLINOIS COLLEGE OF MEDICINE, Honore and Congress Streets.—Organized in 1882 as the College of Physicians and Surgeons. The first class graduated in 1883. It became the Medical Department of the University of Illinois by affiliation in 1896 and an integral part in 1910. The relationship with the university was canceled in June, 1912, but restored in March, 1913. The American Medical Missionary College was absorbed in 1910. Two years of collegiate work are required for admission. The faculty is composed of 60 professors, 89 assistants and instructors, a total of 149. The fees are \$155 each year. The Dean is Dr. D. A. K. Steele. Total registration for 1913-14 was 422; graduates, 113. The thirty-third session begins Oct. 1, 1914, and ends June 11, 1915.

CHICAGO COLLEGE OF MEDICINE AND SURGERY, 706 South Lincoln Street.—Organized in 1901 as the American College of Medicine and Surgery (Chicago Eclectic Medical College). The latter part of the name was dropped in 1902 and it became the Medical Department of Valparaiso University. Eclecticism was dropped in 1905. The name was changed to the above in 1907. One year of collegiate work, including courses in physics, chemistry, biology and a modern language is required for admission. The course covers four years of eight months each. The faculty numbers 114. The total fees of each of the four years are \$150. The Dean is Dr. W. J. Butler. The total registration for 1913-14 was 638; graduates 177. The fourteenth session begins Sept. 29, 1914, and ends May 24, 1915.

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL OF CHICAGO, 2811 Cottage Grove Avenue.—Organized in 1859. The first class was graduated in 1861. The faculty includes 32 professors and 46 lecturers, assistants, etc., a total of 78. One year of collegiate work, including courses in physics, chemistry and biology and a modern language is required for admission. The course extends over four years of eight months each. The tuition fees for the four years, respectively, are \$146, \$131.50, \$165 and \$186.50. The Dean is Dr. Joseph P. Cobb. The total registration for 1913-14 was 92; graduates, 17. The fifty-fifth session begins Sept. 28, 1914, and ends May 27, 1915.

BENNETT MEDICAL COLLEGE, Fulton and Ada Streets.—Organized in 1868 as the Bennett College of Eclectic Medicine and Surgery. Dropped Eclecticism in 1909. In 1910 it united with the Illinois Medical College and became by affiliation the Medical Department of Loyola University. The first class graduated in 1870. The faculty numbers 68. The course covers five years of thirty-two weeks each. The fees are \$150 each year. The Dean is Dr. Maximilian Herzog. The total registration for 1913-14 was 406; graduates, 111. The next session begins Sept. 30, 1914, and ends May 28, 1915.

JENNER MEDICAL COLLEGE, an afternoon and night school, located at 701 South Wood Street.—Organized in 1892. Classes were graduated in 1896 and in all subsequent years. The faculty numbers 48. The Secretary is Dr. John D. MacKellar. Total registration for 1913-14 was 199; graduates, 11. The next session begins Sept. 1, 1914, and ends June 13, 1915. *Reported not recognized by the licensing boards of thirty-one states.*

CHICAGO HOSPITAL COLLEGE OF MEDICINE, another afternoon and night school, located at 3832 Rhodes Avenue.—Organized in 1913. Claimed to have had a registration of 75 in 1913-14. There was 1 graduate. *Official reports indicate that the diplomas from this college are not recognized by the licensing boards of thirty-one states.*

INDIANA

Indiana, population 2,700,876, has one medical college, the Indiana University School of Medicine, located at Indianapolis, a city of 233,650 people, except that the work of the first year is offered also at Bloomington, the seat of the University.

Candidates for license to practice medicine in Indiana who matriculated between Jan. 11, 1910 and Jan. 11, 1914, must have completed one year of collegiate work in addition to an accredited four-year high school course prior to beginning the study of medicine. Those matriculating subsequent to Jan. 11, 1914, must have completed two years of work in a recognized college of liberal arts. This additional preliminary work must have included college courses in physics, chemistry and biology.

Bloomington and Indianapolis

INDIANA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1903, but did not give all of the work of the first two years of the medical course until 1905. In 1907 by union with the State College of Physicians and Surgeons, the complete course in medicine was offered. In 1908 the Indiana Medical College, which was formed in 1905 by the merger of the Medical College of Indiana (organized in 1869), the Central College of Physicians and Surgeons (organized in 1879), and the Fort Wayne College of Medicine (organized in 1879) merged into it. The first class was graduated in 1908. The faculty consists of 72 professors and 58 lecturers, associates and assistants, a total of 130. Two years of collegiate work are required for admission. The work of the first year is emphasized only at Bloomington. The work of the other three years is all at Indianapolis. The fees for the four years, respectively, are \$100, \$100, \$130 and \$130. A fifth optional year leading to the "M.D. cum

laude" has been added. The Secretary at Bloomington is Dr. B. D. Myers; the Dean is Dr. Charles P. Emerson, Indianapolis. The total registration for 1913-14 was 133; graduates, 22. The next session begins Sept. 29, 1914, and ends June 23, 1915.

IOWA

Iowa, population 2,224,771, has two medical colleges. The College of Medicine and the College of Homeopathic Medicine of the State University of Iowa, both located in Iowa City, population 10,091.

Candidates for license to practice medicine in Iowa who graduated subsequent to Jan. 1, 1911, must have completed two years of work in an approved college of liberal arts prior to beginning the study of medicine, this preliminary college work to have included courses in physics, chemistry and biology.

Iowa City

STATE UNIVERSITY OF IOWA COLLEGE OF MEDICINE. University Campus.—Organized in 1869. First session began in 1870. First class graduated in 1871. Absorbed Drake University College of Medicine in 1913. The faculty is made up of 21 professors, 21 lecturers, demonstrators and assistants, a total of 42. Two years of collegiate work, including courses in physics, chemistry, biology and French or German, are required for admission. The course of study covers four years of thirty-six weeks each. Total fees for each of the four years, respectively, are \$110, \$100, \$100 and \$110. The Dean is Dr. Lee Wallace Dean, Iowa City. Total registration for 1913-14 was 108; graduates, 13. The forty-fifth session begins Sept. 21, 1914, and ends June 16, 1915.

STATE UNIVERSITY OF IOWA COLLEGE OF HOMEOPATHIC MEDICINE.—Organized in 1877. The first class graduated in 1878. The faculty is composed of 15 professors and 15 lecturers and assistants, a total of 30. The work of the first two years is taken in classes with the students of the College of Medicine of the State University of Iowa, and it has the same entrance requirements. The fees are \$100 each year, plus a matriculation fee of \$10, paid but once, and a graduation fee of \$10. The Dean is Dr. George Royal. Total registration for 1913-14 was 5; no graduates. The thirty-seventh session begins Sept. 21, 1914, and ends June 16, 1915.

KANSAS

Population 1,690,949, has one medical college. The School of Medicine of the University of Kansas gives its first two years in Lawrence, population 12,915, and the last two years in Rosedale, a suburb of the two Kansas Cities, which together have a population of 330,662.

Candidates for license to practice medicine in Kansas who matriculated in the session of 1910-11 and thereafter must present credentials showing that he matriculated in and graduated from a medical college which required for admission at least one year of collegiate work including college courses in physics, chemistry and biology in addition to an accredited four-year high school course. This applies to all graduates of 1914 and thereafter.

Lawrence and Rosedale

UNIVERSITY OF KANSAS SCHOOL OF MEDICINE.—Organized in 1880. In 1905 it merged with the Kansas City (Mo.) Medical College, founded in 1869, the College of Physicians and Surgeons, founded in 1894, and the Medico-Chirurgical College, founded in 1877. Absorbed Kansas Medical College in 1913. The faculty, including lecturers and clinical assistants, numbers 53. The requirements for admission are two years of collegiate work. The course covers four years of nine months each. The total fees are for each of the first two years, \$30 per year (and for non-residents of the state, \$45); for the last two years \$100 and \$105, respectively. The Dean is Dr. S. J. Crumline; Associate Dean, Dr. M. I. Sudler. The total registration for 1913-14 was 105; graduates, 10. The thirty-fifth session begins Sept. 16, 1914, and ends June 10, 1915.

KENTUCKY

Kentucky, population 2,289,905, has one medical college, the University of Louisville Medical Department, situated in Louisville, a city of 223,928 inhabitants.

To be eligible for license to practice medicine in Kentucky all students matriculating in and after the session of 1914-15 must have completed, in addition to an accredited four-year high school course, at least one year's work in an approved college of liberal arts including college courses in physics, chemistry, biology and a modern language.

Louisville

UNIVERSITY OF LOUISVILLE MEDICAL DEPARTMENT, First and Chestnut Streets.—Organized in 1837 as the Louisville Medical Institute. The first class graduated in 1838, and a class graduated in each subsequent year except in 1863. In 1846 the present name was assumed. In 1907 it absorbed the Kentucky University Medical Department. In 1908 it absorbed the Louisville Medical College, the hospital College of Medicine and the Kentucky School of Medicine. One year of collegiate work is required for admission. It has a faculty of 35 professors and 58 lecturers and assistants, a total of 93. The course covers four years of thirty-two weeks each. The fees are \$165 each year; graduation fee \$10. The Dean is Dr. Henry Enos Tuley. The total registration for 1913-14 was 273, graduates, 54. The next session begins Sept. 28, 1914, and ends June 3, 1915.

LOUISIANA

Louisiana, having a population of 1,656,388, contains one medical college, the School of Medicine of the Tulane University of Louisiana, situated in New Orleans, a city of 339,075.

New Orleans

TULANE UNIVERSITY OF LOUISIANA SCHOOL OF MEDICINE, University Campus and 1551 Canal Street.—Organized in 1834 as the Medical College of Louisiana. Classes were graduated in 1835 and in all subsequent years, except 1863-65, inclusive. It was transferred to Medical Department of the University of Louisiana in 1847 and became the Medical Department of the Tulane University in 1884. Present name in 1913 when it became the School of Medicine of the College of Medicine of the Tulane University. The faculty has 29 professors and 86 instructors, demonstrators, etc., a total of 115. The course covers four years of thirty-two weeks each. One year of collegiate work is required for admission. Total fees are \$195 per year; graduation fee, \$30. The Dean is Dr. Isadore Dyer. The total registration for 1913-14 was 327; graduates, 77. The eighty-first session begins Sept. 28, 1914, and ends June 2, 1915.

MAINE

Maine, population 742,371, has one medical college, located in Brunswick and Portland, the latter having a population of 58,571.

Brunswick-Portland

MEDICAL SCHOOL OF MAINE. The medical department of Bowdoin College. The first two years are given at Bowdoin College, Brunswick, the last two at Portland, building located on Chadwick Street.—Organized in 1820. The first class graduated in 1820. The faculty numbers 66. The course covers four years of eight months each. The total fees are \$110 for each of the first three years and \$135 for the fourth. The Dean is Dr. Addison S. Thayer, 10 Deering Street, Portland. The total number of students in 1913-14 was 67; graduates, 19. Ninety-fourth session begins Oct. 15, 1914, and ends June 24,

MARYLAND

Maryland, with a population of 1,295,346, contains three medical colleges, all located in Baltimore, a city with 558,485 inhabitants. They are as follows: Johns Hopkins University Medical Department, School of Medicine of the University of Maryland and the College of Physicians and Surgeons.

BOSTON UNIVERSITY SCHOOL OF MEDICINE, 80 East Concord Street.—Organized in 1873. In 1874 the New England Female Medical College, founded in 1848, was merged into it. The first class graduated in 1874. One year of collegiate work is required for admission. The faculty includes 33 professors, 35 associates, etc., a total of 68. The course covers four years of eight months each. Total fees for each of the four years, respectively, are \$152, \$147, \$127 and \$155. The Dean is Dr. John P. Sutherland. Total registration for 1913-14 was 113; graduates, 22. The forty-second session begins Oct. 1, 1914, and ends June 2, 1915.

TUFTS COLLEGE MEDICAL SCHOOL, 416 Huntington Avenue.—Organized in 1893 as the Medical Department of Tufts College. The first class graduated in 1894. It has a faculty of 42 professors and 80 assistants, lecturers, etc., a total of 122. One year of collegiate work is required for admission. The course covers four years of eight months each. The total fees are \$155 each year. The Dean is Dr. Charles F. Painter. Total registration for 1913-14 was 311; graduates, 62. The twenty-first session begins Sept. 30, 1914, and ends June 1, 1915.

COLLEGE OF PHYSICIANS AND SURGEONS, 517 Shawmut Avenue.—Organized in 1880. The first class graduated in 1882. The college announcement gives the names of 228 "matriculants and applicants" for the session of 1913-14, which included both dental and medical students. Fairly reliable information, however, shows that the total attendance of medical students during 1913-14 was 110. There were 13 graduates. This college has been reported not recognized by the Massachusetts Medical Society and by the licensing boards of thirty-one states.

MICHIGAN

Michigan, population 2,810,173, has three medical colleges. Two of these, the University of Michigan Department of Medicine and Surgery and the Homeopathic Medical College of the University of Michigan, are located at Ann Arbor, a city of 14,817 people. The Detroit College of Medicine and Surgery is located at Detroit, a city of 465,766 inhabitants.

To be eligible for license to practice medicine in Michigan, all students matriculating in and after the session of 1914-15, in addition to an accredited four-year high school education, must have completed at least one year's work in an approved college of liberal arts including college courses in physics, chemistry and biology, prior to beginning the study of medicine.

year's internship in an approved hospital. The entrance requirements are two years of university work which must include one year each of physics, general chemistry, qualitative analysis, zoology or botany, and French or German, all in addition to a four-year high school course, including two years of Latin. Students entering hereafter will be required to secure a degree of B.S. or A.B. before the M.D. is granted. Total fees are \$150 each year. The Dean is Dr. E. P. Lyon. The total registration for 1913-14 was 169; graduates, 30. The twenty-seventh session begins Sept. 16, 1914, and ends June 11, 1915.

MISSISSIPPI

Mississippi, population 1,797,114, has one medical college, the Department of Medicine of the University of Mississippi, which is located at Oxford, a city of 1,825 inhabitants.

Oxford

UNIVERSITY OF MISSISSIPPI DEPARTMENT OF MEDICINE.—Organized in 1903. Gives only the first two years of the medical course. The session extends over eight and a half months. Entrance requirements are one year of collegiate work in addition to an accredited four-year high school education. The total fees each year are, respectively, \$102 and \$100. The faculty numbers 14. The Dean is Dr. W. S. Leathers. The total registration for 1913-14 was 35. The twelfth session begins Sept. 17, 1914, and ends June 1, 1915.

MISSOURI

Missouri, population 3,293,335, has seven medical colleges. St. Louis, population 687,029, contains four of these, viz., the School of Medicine of St. Louis University, Washington University Medical School, St. Louis College of Physicians and Surgeons and the American Medical College. Kansas City, which with Kansas City, Kan., has a total population of 330,662, has two colleges, namely: the Kansas City Hahnemann Medical College and the Eclectic Medical University. The School of Medicine of the University of Missouri is at Columbia, a town of 9,662 people.

Columbia

UNIVERSITY OF MISSOURI SCHOOL OF MEDICINE.—Organized at St. Louis in 1845; was discontinued in 1859, but was reorganized at Columbia in 1872. Teaching of the clinical years was suspended in 1909. The faculty includes 9 professors and 6 assistant professors, lecturers, etc., a total of 15. The course covers two years of nine months each. The entrance requirements are two years of college work including English, 5 hours; German, 5 hours; general zoology, 5 hours; physics, 5 hours; inorganic chemistry, 5 hours; elective, 35 hours. Equivalent work in foreign language may be substituted for the English and German. Total fees are \$40 each year. The acting Dean is Dr. Guy L. Noyes. Total registration of students for 1913-14 was 55. The next session begins Sept. 14, 1914, and ends June 3, 1915.

Kansas City

KANSAS CITY HAHNEMANN MEDICAL COLLEGE, 916 Tracy Avenue.—Organized in 1888 as the Kansas City Homeopathic Medical College. The first class graduated in 1899. In 1902 it united with the Hahnemann Medical College of Kansas City University, taking the present title. The faculty numbers 40. The fees are \$125 each year. The Registrar is Dr. Sam H. Snow. Total registration for 1913-14 was 46; graduates, 13. The next session begins Sept. 8, 1914, and ends May 20, 1915.

ECLECTIC MEDICAL UNIVERSITY, 1423 Independence Avenue.—Organized at Kansas City, Mo., in 1898 with the present title. Moved to Kansas City, Kan., in 1907, and took the name of Western Eclectic College of Medicine and Surgery. Returned to Kansas City, Mo., in 1909 and resumed the present title. First class graduated in 1900. The total registration for 1913-14 was 65; graduates 14. Reported not in good standing by the Missouri State Board of Health and by twenty-eight other state licensing boards.

St. Louis

WASHINGTON UNIVERSITY MEDICAL SCHOOL, Kingshighway and Euclid Avenue.—Organized in 1842 as the Medical Department of St. Louis University. In 1855 it was chartered as an independent institution under the name of St. Louis Medical College. The first class graduated in 1843. In 1891 it became the Washington University Medical School. In 1899 it absorbed the Missouri Medical College. The faculty comprises 23 professors and 56 lecturers, instructors, etc., a total of 79. Two full years of college work are required for admission including courses in English, physics, chemistry and biology and a reading knowledge of German. The course is four years of eight months each. The total fees for the four years are, respectively, \$155, \$150, \$150 and \$155. The Dean is Dr. Eugene L. Opie. The total registration for 1913-14 was 6; graduates, 15. The next session begins Sept. 24, 1914, and ends June 10, 1915.

ST. LOUIS UNIVERSITY SCHOOL OF MEDICINE, 1402 South Grand Avenue.—Organized in 1901 by union of Marion Sims Medical College, organized in 1890, and Beaumont Hospital Medical College, organized in 1886. It became the Medical Department of St. Louis University in 1903. The faculty is composed of 53 professors, 69 lecturers and assistants, a total of 122. One year of college subjects preliminary to the four years of medical subjects is given in the medical school. The curriculum covers four years of thirty-four weeks each. The total fees are \$140 each year. The total registration for 1913-14 was 204; graduates, 45. The Dean is Dr. Hanau W. Loeb. The next session begins Sept. 15, 1914, and ends May 17, 1915.

ST. LOUIS COLLEGE OF PHYSICIANS AND SURGEONS, Jefferson Avenue and Gamble Street.—Organized in 1869. Classes graduated in 1870 and each subsequent year until 1873, when it suspended. It was reorganized in 1879. Classes graduated in 1880 and subsequent years. Total registration for 1913-14 was 48; graduates, 24.

AMERICAN MEDICAL COLLEGE, Garrison and Lawton Avenues.—Organized in 1873 as an Eclectic College. Eclecticism dropped in 1910. Absorbed the Barnes Medical College in 1911. Became the Medical

Department of the National University of Arts and Sciences in 1912. Two classes were graduated each year from 1874 to 1883, inclusive. Since then one class has graduated each year. The course covers four years of eight and a half months each. Beginning with the session of 1914-15 a five-year course will be required including a preliminary year in physics, chemistry and biology. Fees: matriculation, \$5; tuition each year, \$135. The Dean is Dr. James Moores Ball. The total registration for 1913-14 was 146; graduates, 34. The next session begins Sept. 22, 1914, and ends June 7, 1915.

NEBRASKA

Nebraska, population 1,192,214, has three medical colleges. The University of Nebraska College of Medicine and the John A. Creighton Medical College of Omaha, population 124,096, and the Cotner University Medical College at Lincoln, population 43,973.

Bethany-Lincoln

COTNER UNIVERSITY MEDICAL COLLEGE, Eclectic. University Campus Bethany, and corner Thirtieth and P Streets, Lincoln. It is the Medical Department of Cotner University.—Organized in 1890 as the Lincoln Medical College. Assumed present title in 1911. The first class graduated in 1891. The faculty numbers 33. The fees are \$100 each year. The Registrar is Prof. R. L. Huff, Lincoln. The total registration for 1913-14 was 29; graduates, 5. The next session begins Sept. 14, 1914, and ends May 27, 1915.

Omaha

JOHN A. CREIGHTON MEDICAL COLLEGE, Fourteenth and Davenport Streets. It is the Medical Department of Creighton University.—Organized in 1892. The first class graduated in 1895. It has a faculty of 15 professors and 38 associates, lecturers and assistants, a total of 53. One year of collegiate work is required for admission. The course of study embraces four years of eight months each. The total fees for the four years, respectively, are \$130, \$120, \$120 and \$120. The Dean is Dr. A. L. Muirhead. Total registration for 1913-14 was 182; graduates, 35. The twenty-third session begins Sept. 1, 1914, and ends April 30, 1915.

UNIVERSITY OF NEBRASKA COLLEGE OF MEDICINE, Forty-Second Street and Dewey Avenue.—Organized in 1881 as the Omaha Medical College. The first class graduated in 1882. It became the Medical Department of Omaha university in 1891. In 1902 it affiliated with the University of Nebraska, with the present title. The first two years were given at Lincoln and the last two in Omaha until 1913 when all four years were transferred to Omaha. The faculty is composed of 31 professors and 27 lecturers and instructors, total 58. Two years of collegiate work are required for admission including courses in physics, chemistry, zoology and German. The fees are approximately \$100 per annum. The Secretary is Dr. Irving S. Cutler. Total registration for 1913-14 was 84; graduates, 11. The next session begins Sept. 14, 1914, and ends June 4, 1915.

NEW HAMPSHIRE

New Hampshire, population 443,140 has one medical college, located at Hanover, population 1,884.

Only graduates of medical colleges registered by the Regents of New Hampshire are eligible to obtain licenses to practice medicine. Medical colleges to be registered, for all students matriculating in the session of 1914-15 and thereafter, must require for admission at least one year of collegiate work, including college courses in physics, chemistry and biology in addition to a standard four-year high school education.

DARTMOUTH MEDICAL SCHOOL.—Organized as New Hampshire Medical Institute in 1797. The first class graduated in 1798. It is under the control of the trustees of Dartmouth College. Clinical teaching was discontinued in 1914. The faculty is made up of 19 professors and 7 instructors, a total of 26. Two years of collegiate work are required for admission. The course covers nine calendar months in each year, or eight months of actual teaching. Candidates for the B.S. degree in Dartmouth College may substitute the work of the first two years in medicine for that of the junior and senior years in the academic department. Candidates for the A.B. degree may make a similar saving of one year. The fees for the two years in medicine are, respectively, \$169.50 and \$173.50. Dean, Dr. John M. Gile; Secretary, Colin C. Stewart. The next session opens September 24, 1914, and ends June 24, 1915.

NEW YORK

New York State, population 9,113,614, has ten medical colleges. Seven of these, College of Physicians and Surgeons (Columbia University), Long Island College Hospital, New York Homeopathic Medical College and Hospital, New York Medical College and Hospital for Women, Cornell University Medical College, the University and Bellevue Hospital Medical College and Fordham University School of Medicine, are located in New York City, population 4,766,883. Albany Medical College is located in Albany, a city of 100,253 people. The University of Buffalo Medical Department is situated in Buffalo, population 423,715. The College of Medicine, Syracuse University, is in Syracuse, a city of 137,249 inhabitants.

Albany

ALBANY MEDICAL COLLEGE, Lancaster and Jay Streets.—Organized in 1838. The first class graduated in 1839. It became the Medical Department of Union University in 1873. The faculty is composed of 18 professors and 85 lecturers, assistants, etc., a total of 103. One year of collegiate work, including college courses in physics, chemistry and

biology are required for admission. The curriculum covers four years of eight months each. The fees for each of the four years are, respectively, \$135, \$140, \$120 and \$130. The Registrar is Dr. Joseph D. Craig. The total registration for 1913-14 was 258; graduates 52. The eighty-fourth session begins Sept. 22, 1914, and ends May 25, 1915.

Buffalo

UNIVERSITY OF BUFFALO MEDICAL DEPARTMENT. High Street, near Main.—Organized in 1846. The first class graduated in 1874. It absorbed the Medical Department of Niagara University in 1898. The faculty is composed of 33 professors and 67 lecturers, assistants, etc., a total of 100. One year of collegiate work, including college courses in physics, chemistry and biology are required for admission. The course covers four years of eight months each. The total fees for the four years, respectively, are \$185, \$180, \$140 and \$140. The Dean is Dr. Herbert U. Williams. Total registration for 1913-14 was 236; graduates, 47. The sixty-ninth session begins Sept. 21, 1914, and ends June 4, 1915.

New York

COLUMBIA UNIVERSITY COLLEGE OF PHYSICIANS AND SURGEONS, 437 West Fifty-Ninth Street.—Organized in 1807 by the regents of the University of the State of New York as their medical department. The first class graduated in 1811. Affiliated with Columbia College in 1814 and was permanently connected in 1860, when it became the Medical Department of Columbia College. That institution became Columbia University in 1891. The faculty is composed of 76 professors and 133 instructors, demonstrators, etc., a total of 209. Two years of collegiate work, including courses in physics, chemistry and biology are required for admission. The work covers four years of eight months each. The Dean is Dr. Samuel W. Lambert. The total fees for the first year are \$255; for the second and third, \$250, and \$275 for the fourth year. Total registration for 1913-14 was 308; graduates, 71. The one hundred and seventh session begins Sept. 23, 1914, and ends June 2, 1915.

CORNELL UNIVERSITY MEDICAL COLLEGE, First Avenue and Twenty-Eighth Street, New York City, and Ithaca.—Organized in 1898. The first class was graduated in 1899. The work of the first year may be taken either in Ithaca or New York. The faculty is composed of 38 professors and 99 assistants, lecturers, instructors, etc., a total of 137. All candidates for admission must be graduates of approved colleges or scientific schools or seniors of approved colleges which will permit them to substitute the first year of this medical school for the fourth year of their college course and will confer on them the Bachelor degree on the completion of the year's work. The candidate must also have such knowledge of physics, inorganic chemistry and biology as may be obtained in college by a year's course in these subjects when accompanied by laboratory work. The fees for each of the four years are, respectively, \$190, \$185, \$185 and \$200. The Dean is Dr. William M. Polk. Total registration for 1913-14 was 108; graduates, 20. The seventeenth session begins Sept. 30, 1914, and ends June 10, 1915.

FORDHAM UNIVERSITY SCHOOL OF MEDICINE, Bathgate Avenue and Fordham Road.—Organized in 1905. First class graduated in 1909. The faculty consists of 49 professors and 50 lecturers and assistants, a total of 99. The course of instruction covers four years of eight and a half months each. Fees, \$700 each year. A year's work in a recognized college of liberal arts, including college courses in physics, chemistry and biology, is required for admission. The Dean is Dr. William P. Healy. The total registration for 1913-14 was 175; graduates, 29. The tenth session begins Sept. 25, 1914, and ends June 8, 1915.

LONG ISLAND COLLEGE HOSPITAL, Henry Street, near Atlantic Avenue, Brooklyn.—Organized in 1858. The first class graduated in 1860. It has a faculty of 39 professors and 74 assistants, instructors, etc., a total of 113. A year of collegiate work including college courses in physics, chemistry and biology is required for admission. The course covers four years of eight months each. Fees: First year, \$210, second year, \$205, third, \$200, and \$200 for the fourth year. The Secretary is Dr. Joseph H. Raymond. Total registration 1913-14 was 360; graduates, 79. The fifty-seventh session begins Sept. 22, 1914, and ends June 7, 1915.

NEW YORK HOMEOPATHIC MEDICAL COLLEGE AND FLOWER HOSPITAL, Eastern Boulevard, between Sixty-Third and Sixty-Fourth Streets.—Organized in 1858. Incorporated in 1860 as the Homeopathic Medical College for the State of New York. The present title was assumed in 1869. The first class graduated in 1861. The faculty consists of 27 professors and 44 assistants, lecturers, etc., a total of 71. The total fees for each of the four years respectively are \$165, \$160, \$150 and \$180. The Dean is Dr. Royal S. Copeland. Total registration for 1913-14 was 237; graduates, 43. The fifty-fifth session begins Sept. 30, 1914, and ends May 26, 1915.

NEW YORK MEDICAL COLLEGE AND HOSPITAL FOR WOMEN (Homeopathic) 17-19 West One Hundred and First Street.—Organized in 1863. The first class graduated in 1864. The faculty consists of 30 professors and 28 lecturers and assistants, a total of 58. The course covers four years of thirty weeks each. The fees for each of the four years, respectively, are \$155, \$150, \$135 and \$155. The Dean is Dr. Cornelia C. Brant. The total registration for 1913-14 was 42; graduates, 7. Matriculants are not listed in the annual announcement. The fifty-second session begins Sept. 23, 1914, and ends June 3, 1915.

UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE, First Avenue and Twenty-Sixth Street.—Organized in 1898 by the union of the New York University Medical College, organized in 1841, and the Bellevue Hospital Medical College, organized in 1861. It is the Medical Department of New York University. The faculty is composed of 69 professors and 56 instructors, etc., in all 125. The course covers four years of eight months each. Entrance requirements are one year of years of college work, in addition to a standard four-year high school course, collegiate work, a addition to a standard four-year high school course, including college courses in physics, chemistry and biology. The fees are \$200 per year; graduation fee, \$25. The Secretary is Dr. Samuel A. Brown. Total registration for 1913-14 was 333; graduates, 83. The next session begins Sept. 23, 1914, and ends June 9, 1915.

Syracuse

SYRACUSE UNIVERSITY COLLEGE OF MEDICINE, 307-311 Orange Street.—Organized in 1872, when the Geneva Medical College was removed to Syracuse, under the title "The College of Physicians and Surgeons of Syracuse University." Present title assumed in 1875. The first class graduated in 1873 and a class graduated each subsequent year. In 1884 the amalgamation with the university was made complete. Two years of a recognized college course are required for admission. The course covers four years of thirty-five weeks each. The total fees for each of the four years are respectively, \$192, \$187, \$187 and \$207. The

faculty is composed of 23 professors and 50 associate and assistant professors, lecturers and instructors. The Dean is Dr. John L. Heffron. The total enrollment for 1913-14 was 96; graduates, 16. The forty-third session begins Sept. 15, 1914, and ends June 9, 1915.

NORTH CAROLINA

North Carolina, population 2,206,287, has three medical schools, all of which give only the first two years of the medical course. The School of Medicine of the University of North Carolina is located at Chapel Hill, population 1,200. The Leonard Medical School is at Raleigh, population 19,218. Wake Forest College School of Medicine is at Wake Forest, population 823.

Chapel Hill

UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE.—Organized in 1890. Until 1902 this school gave only the work of the first two years, when the course was extended to four years by the establishment of a department at Raleigh. The first class graduated in 1903. A class was graduated each subsequent year, including 1910, when the clinical department at Raleigh was discontinued. One year of collegiate work is required for admission. The faculty is composed of 12 professors and 13 lecturers, assistants, etc., a total of 25. The total fees for the two years, respectively, are \$120 and \$125. The Dean is Dr. I. H. Manning. The total registration for 1913-14 was 60. The twenty-ninth session begins Sept. 10, 1914, and ends June 2, 1915.

Raleigh

LEONARD MEDICAL SCHOOL.—Colored. This department of Shaw University was established in 1882. Classes were graduated in 1886, 1888 and in all subsequent years, including 1914 when clinical teaching was discontinued. A year of collegiate work is required for admission. It has a faculty of 14. The course covers four years of seven and a half months each. The total fees for each year are \$57; graduation fee, \$10. The Dean is Dr. George H. Stoddard. Total registration for 1913-14 was 76; graduates 8. The thirty-third session begins Sept. 30, 1914, and ends May 13, 1915.

Wake Forest

WAKE FOREST COLLEGE SCHOOL OF MEDICINE.—This school was organized in 1902. The faculty, including the professors of chemistry, physics, and biology numbers 10, exclusive of laboratory assistants. Only the first two years of the medical course are offered after the completion of freshmen and sophomore college work, and on this combined course the B.S. degree is conferred. Each annual course extends over nine months. The fees for each year aggregate \$103. The Secretary is E. B. Earnshaw. The total registration for 1913-14 was 28. The thirteenth session begins Sept. 1, 1914, and ends May 21, 1915.

NORTH DAKOTA

North Dakota, population 577,056, has one medical college, the School of Medicine of the University of North Dakota, which is situated at University, near Grand Forks, a city of 12,478 people. It gives only the first two years of the medical course.

Candidates for license to practice medicine in North Dakota who graduated in 1912 and thereafter, in addition to a four-year high school education must have completed two years of work in an approved college of liberal arts including courses in Latin, physics, chemistry, botany and zoology, prior to beginning the study of medicine.

University

UNIVERSITY OF NORTH DAKOTA SCHOOL OF MEDICINE.—Organized in 1905. The faculty is composed of 5 professors and 12 instructors, a total of 17. The course consists of two years' academic work and two years of medical college subjects, occupying nine months each year. The total fee for each of the medical years is \$50. The Dean is Dr. H. E. French. The total registration for 1913-14 was 14. The tenth session begins Sept. 22, 1914, and ends June 16, 1915.

OHIO

Ohio, population 4,767,121, has five medical colleges. Two of these, the Medical College of the University of Cincinnati and the Eclectic Medical College, are located in Cincinnati, a city of 364,463 inhabitants. Cleveland, population 560,663, contains one medical school, Western Reserve University School of Medicine. Columbus, population 181,548, contains one medical college, the Ohio State University College of Medicine.

Cincinnati

THE MEDICAL COLLEGE OF THE UNIVERSITY OF CINCINNATI, Clifton Avenue, west of Vine Street.—Organized in 1909 by the union of the Ohio Medical College (founded in 1819) with the Miami Medical College (founded in 1852). The Ohio Medical College became the Medical Department of the University of Cincinnati, April 26, 1896. Under a similar agreement, March 2, 1909, the Miami Medical College also merged into the University, when the title of Ohio-Miami Medical College of the University of Cincinnati was taken. The faculty consists of 37 professors, 100 associates, assistants, etc., a total of 137. Two years of college work are required for admission. The course covers four years of eight months each. The fees are a tuition fee of \$150 a year; a matriculation fee of \$5, payable but once, and a graduation fee of \$25. The Dean is Dr. Christian R. Holmes. The total registration for 1913-14 was 60; graduates, 14. The next session begins Sept. 29, 1914, and ends June 12, 1915.

ELECTIC MEDICAL COLLEGE, 630 West Sixth Street.—Organized in 1833 at Worthington as the Worthington Medical College. Removed to Cincinnati in 1843. In 1845 it was chartered as the Eclectic Medical Institute. In 1857 the American Medical College, organized in 1839, was merged into it, and in 1859 the Eclectic College of Medicine and Surgery, organized in 1856, merged into it. In 1910 it assumed its present title. Classes were graduated in 1833 and in all subsequent years except 1839 to 1843, inclusive. It has a faculty of 23 professors and 12 lecturers and assistants, a total of 35. The course covers four years of eight months each. The fees are \$120 for each year. The Secretary is Dr. John K. Scudder. Total registration for 1913-14 was 87; graduates, 19. The next session begins Sept. 10, 1914, and ends May 10, 1915.

Cleveland

CLEVELAND-PULTE MEDICAL COLLEGE, Prospect Avenue and Huron Road.—Homeopathic.—Organized in 1849 as the Western College of Homeopathic Medicine. The first class graduated in 1853. In 1857 it became the Western Homeopathic College and in 1870 it became the Homeopathic Hospital College when the Homeopathic Medical College for Women, organized in 1868, merged into it. In 1894 it became the Cleveland University of Medicine and Surgery. In 1898 it merged with the Cleveland Medical College, organized in 1890, and assumed the title of Cleveland Homeopathic Medical College. In 1910 Pulte Medical College of Cincinnati merged into it and the present title was assumed. Total registration for 1913-14 was 53; graduates, 11. It is reported that this college has been transferred to the Ohio State University at Columbus where the establishing of a homeopathic college is contemplated.

WESTERN RESERVE UNIVERSITY SCHOOL OF MEDICINE, 1355 East Ninth Street.—Organized in 1843 as the Cleveland Medical College. The first class graduated in 1844. It assumed the present title in 1881. In 1910 it absorbed the Cleveland College of Physicians and Surgeons. The faculty includes 44 professors and 53 lecturers, assistants, etc., a total of 97. The curriculum embraces four years of eight and one-half months each. Three years of college work are required for admission. The total fees for each of the four years are, respectively, \$162, \$153, \$150 and \$155. The Secretary is Dr. F. C. Waite. The total registration for 1913-14 was 157; graduates, 34. The twenty-second session begins Oct. 1, 1914, and ends June 17, 1915.

Columbus

OHIO STATE UNIVERSITY COLLEGE OF MEDICINE—Buttles Avenue and Park Street.—Organized in 1907 as the Starling-Ohio Medical College by the union of Starling Medical College (organized 1834) with the Ohio Medical University (organized 1890). In 1914 it became an integral part of the Ohio State University with its present title. The faculty consists of 38 professors and 38 lecturers, demonstrators, etc., a total of 76. One year of collegiate work is required for admission. Beginning with the session of 1915-16, two years of collegiate work will be required. The course covers four years of eight months each. Matriculation, \$5; tuition of \$150 each year. The Dean is Dr. W. J. Means. The total registration for 1913-14 was 284; graduates 54. The next session begins Sept. 16, 1914, and ends June 1, 1915.

OKLAHOMA

Oklahoma, population 1,657,155, has one medical college, the School of Medicine of the University of Oklahoma. The work of the first and second years is given in the academic laboratories at Norman, a city of 3,040 inhabitants. The work of the third and fourth years is given in Oklahoma City, which has a population of 64,205 and which is eighteen miles north of Norman.

Norman and Oklahoma City

UNIVERSITY OF OKLAHOMA SCHOOL OF MEDICINE—Organized in 1900. Gave only the first two years of the medical course until 1910, when a clinical department was established at Oklahoma City. It has a faculty of 17 professors and 73 instructors, a total of 90. The course is four years of nine months each. An optional course of six years is offered for the degrees of B.S. and M.D. The total fees for the four years are, respectively, \$55, \$28, \$100 and \$105. The Dean is Dr. Curtis R. Day, 317 East Fourth Street, Oklahoma City. The total registration for 1913-14 was 94; graduates, 14. The fifteenth session begins Sept. 22, 1914, and ends June 10, 1915.

OREGON

Oregon, population 672,765, has one medical college, the University of Oregon Department of Medicine located in Portland, a city of 207,214 population.

Portland

UNIVERSITY OF OREGON DEPARTMENT OF MEDICINE, Lovejoy and Twenty-Third Streets.—Organized in 1887. The first class graduated in 1888. The Willamette University Medical Department was merged in 1913. It has a faculty of 19 professors and 43 lecturers, assistants, etc., a total of 62. Entrance requirements are one year of college work or its equivalent. The course is four years of eight months each. Fees: Matriculation, \$5; tuition, \$150 each year. The Dean is Dr. K. A. J. Mackenzie. The total registration for 1913-14 was 79; graduates, 26. The twenty-eighth session begins Oct. 1, 1914, and ends June 1, 1915.

PENNSYLVANIA

Pennsylvania, population 7,665,111, has seven medical colleges. Of these Philadelphia, having a population of 1,599,008, contains six, as follows: University of Pennsylvania School of Medicine, Jefferson Medical College, Hahnemann Medical College and Hospital, Woman's Medical Col-

lege of Pennsylvania, Medico-Chirurgical College of Philadelphia and Temple University Department of Medicine. The other school, the School of Medicine of the University of Pittsburgh, is situated in Pittsburgh, a city of 533,905.

To be eligible for license to practice medicine in Pennsylvania, students matriculating in the session of 1914-15 and thereafter, in addition to a four-year high school education must have completed a year's work either in an approved college of liberal arts or in a preliminary year in the medical college, including college courses in physics, chemistry and biology, before beginning the study of medicine. He must also have completed an internship of at least one year in an approved hospital.

Philadelphia

UNIVERSITY OF PENNSYLVANIA SCHOOL OF MEDICINE, Thirty-Sixth Street and Hamilton Walk.—Organized in 1765. Classes were graduated in 1768 and in all subsequent years except 1772-79, inclusive. The original title was the Department of Medicine, College of Philadelphia, which was changed to the present title in 1791. It granted the first medical diploma issued in America. The faculty is made up of 35 professors, associate, adjunct and assistant professors and 139 demonstrators, lecturers, associates, instructors, etc., a total of 174. The requirements for admission are the equivalent of work prescribed for the first two years in recognized colleges, which work must include a knowledge of physics, chemistry and general biology or zoology and two foreign languages, one of which must be French or German. The course embraces study of four years of thirty-four weeks each. The total fees for each of the four years are, respectively, \$229.50, \$211.50, \$210 and \$213. The Dean is Dr. William Pepper. Total registration for 1913-14 was 266; graduates, 74. The one hundred forty-third session begins Sept. 25, 1914, and ends June 16, 1915.

JEFFERSON MEDICAL COLLEGE, Tenth and Walnut Streets.—Organized in 1825 as the Medical Department of Jefferson College, Cannonsburg. The first class graduated in 1826. The present title was assumed in 1838. It has a faculty of 27 professors and 130 lecturers, demonstrators, etc., a total of 157. Entrance requirements are a completed course in a standard secondary school and in addition a preliminary year devoted to college courses in physics, chemistry and biology. The course of study covers graded work of four years of eight and a half months each. The tuition is \$200 a year, with a matriculation fee of \$5, paid but once. The Subdean is Dr. Ross V. Patterson. The total registration for 1913-14 was 648; graduates, 147. The ninetieth session begins Sept. 24, 1914, and ends June 5, 1915.

MEDICO-CHIRURGICAL COLLEGE OF PHILADELPHIA, Cherry Street, between Seventeenth and Eighteenth Streets.—Organized in 1881. The first class graduated in 1882. The faculty is composed of 45 professors and 69 lecturers, assistants, etc., a total of 114. Entrance requirements are a completed course in a standard secondary school and in addition a preliminary year devoted to college courses in physics, chemistry and biology. The work embraces four years of eight months each. The fees for each of the four years are, respectively, \$162.50, \$159, \$155.50 and \$153. The Dean is Dr. Seneca Egbert. The total registration for 1913-14 was 350; graduates, 75. The thirty-fourth session begins Sept. 21, 1914, and ends June 4, 1915.

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA, Twenty-First and N. College Avenue. Organized in 1850. Classes were graduated in 1851 and in all subsequent years except 1861 and 1862. It has a faculty of 11 professors and 50 assistants, lecturers, etc., in all 61. Entrance requirements are a completed course in a standard secondary school and in addition a preliminary year devoted to college courses in physics, chemistry and biology. Beginning in 1915 this requirement will be further increased to two years of collegiate work. The curriculum covers four years of eight months each. Fees for each of the four years are, respectively, \$187, \$181, \$178.50, \$179.50. The Dean is Dr. Clara Marshall. The total registration for 1913-14 was 93; graduates, 18. The sixty-fifth session begins Sept. 16, 1914, and ends June 2, 1915.

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL, 226 North Broad Street.—Organized in 1848 as the Homeopathic Medical College of Pennsylvania. In 1869 it united with the Hahnemann Medical College of Philadelphia, taking the present title. The first class graduated in 1849. Entrance requirements are a completed course in a standard secondary school and in addition a preliminary year devoted to college courses in physics, chemistry and biology. It has a faculty of 36 professors and 53 lecturers, instructors, etc., in all 89. The work covers four years of eight and a half months each. Fees: For each year, \$180; matriculation, \$5; laboratory fee, \$10. The Dean is Dr. William A. Pearson. The total registration for the college year 1913-14 was 93; graduates, 14. The sixty-seventh session begins Sept. 21, 1914, and ends June 3, 1915.

THE TEMPLE UNIVERSITY DEPARTMENT OF MEDICINE, Eighteenth and Buttonwood Streets.—Organized in 1901. The first class graduated in 1904. The faculty numbers 97. It gives a five-year day course. The fees are \$150 per year. The Dean is Dr. Frank C. Hammond. The total registration for 1913-14 was 101; graduates, 18. The fourteenth session begins Sept. 17, 1914, and ends June 5, 1915.

Pittsburgh

UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE, Grant Boulevard.—Organized in 1886 as the Western Pennsylvania Medical College and in 1908 became an integral part of the University of Pittsburgh, removing to the university campus in 1910. The first class graduated in 1887. The faculty is composed of 16 professors and 79 associates, assistants, etc., 95 in all. Entrance requirements are two years of recognized college work, to have included essentially courses in chemistry (inorganic and organic), physics, biology and German or French, based on a four-year high school preparation. It is possible for students to get the degree of B.S. and M.D. in six years. The course of study for medicine alone is four years of eight and a half months each. The tuition is \$220 a year, \$210 if paid in advance. The Dean is Dr. Thomas S. Arbuthnot. The total registration for 1913-14 was 124; graduates, 46. The twenty-ninth session begins Sept. 28, 1914, and ends June 16, 1915.

SOUTH CAROLINA

South Carolina, population 1,515,400, has one medical college, situated in Charleston, a city of 58,833 people.

Charleston

THE MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA, Queen and Franklin Streets.—Founded in 1823 as the Medical College of South Carolina. In 1832 it was chartered with the present title. Classes were graduated in 1825 and in all subsequent years except 1861 to 1865, inclusive. In 1912 by legislative enactment it became a state institution. It has a faculty of 29 professors and 33 lecturers, instructors, etc., a total of 62. The course covers four years of eight months each. One year of collegiate work including courses in physics, chemistry and biology is required for admission in addition to a standard high school preparation. The total fees are \$140 each year. The Dean is Dr. Robert Wilson, Jr. Total enrollment for 1913-14 was 104; graduates, 19. The eighty-sixth session begins Oct. 1, 1914, and ends June 3, 1915.

SOUTH DAKOTA

South Dakota, population 583,888, has one medical college, the University of South Dakota College of Medicine, located at Vermilion, a city of 2,147 people.

To be eligible for license to practice medicine in South Dakota graduates of 1915 and thereafter must show that they matriculated in and graduated from medical colleges which required at least two years of collegiate work for admission, including courses in physics, chemistry, biology and a modern language. This affects all students who matriculated in the session of 1911-12 and thereafter.

Vermilion

UNIVERSITY OF SOUTH DAKOTA COLLEGE OF MEDICINE.—Organized in 1907. Offers only the first two years of the medical course. Two years' work in a college of liberal arts is required for admission. The fees are \$60 each year. The faculty numbers 9. The Dean is Christian P. Lommen, B.S. The total registration for 1913-14 was 14. The eighth session begins Sept. 15, 1914, and ends June 10, 1915.

TENNESSEE

Tennessee, population 2,184,789, has four medical colleges. Of these Vanderbilt University Medical Department and Meharry Medical College are situated in Nashville, a city with a population of 106,476. The College of Medicine of the University of Tennessee and the University of West Tennessee College of Medicine and Surgery are located in Memphis, population 136,363.

Memphis

UNIVERSITY OF TENNESSEE COLLEGE OF MEDICINE, three buildings, 879 Madison Avenue, 880 Monroe Avenue, and 718 Union Avenue.—Organized in 1876 at Nashville as Nashville Medical College. Became Medical Department University of Tennessee 1878. First class graduated 1879 and a class graduated each subsequent year. In 1909 it united with the Medical Department of the University of Nashville to form the joint Medical Department of the Universities of Nashville and Tennessee. This union was dissolved in 1911. The Trustees of the University of Nashville by formal action of that Board named the University of Tennessee College of Medicine as its legal successor in medical teaching, transferring all of its college and hospital equipment to the successor. This college then removed to Memphis, where it united with the College of Physicians and Surgeons. The Memphis Hospital Medical College was merged in 1913. Entrance requirements are a completed secondary education plus one year of collegiate work. The fees are \$100 per year for bona fide residents of the state and \$125 per year for non-residents; graduation fee \$25. The Dean is Dr. Herbert Thomas Brooks. Total registration 1913-14, 321; graduates, 77. The next session begins Sept. 22, 1914, and ends June 4, 1915.

UNIVERSITY OF WEST TENNESSEE COLLEGE OF MEDICINE AND SURGERY. Colored. 1190 South Phillips Place.—Organized in 1900. The first class graduated in 1904 and a class graduated each subsequent year. It has a faculty of 21. The course is four years of thirty weeks each. The fees are \$55 per year; graduation \$10 extra. The Dean is Dr. M. V. Lynk. Registration for 1913-14 was 73; graduates, 25. The fifteenth session begins Sept. 14, 1914, and ends May 1, 1915.

Nashville

VANDERBILT UNIVERSITY MEDICAL DEPARTMENT.—This school was founded in 1874. The first class graduated in 1875. The faculty consists of 25 professors and 40 lecturers, a total of 65. One year of collegiate work is required for admission. The course covers four years of nearly eight months each. The total fees for each of the first three years are \$150, and for the fourth year, \$175. The Acting Dean is Dr. L. E. Burch. The total registration for 1913-14 was 381; graduates, 65. The forty-first session begins Sept. 16, 1914, and ends June 16, 1915.

MEHARRY MEDICAL COLLEGE. Colored. Maple and Chestnut Streets.—This school was organized in 1876 and is the Medical Department of Walden University. The faculty is made up of 13 professors and 15 instructors, demonstrators, etc., 28 in all. The work embraces four years of thirty weeks each. The total fees for each of the first three years are \$70 and for the fourth year, \$80. The Dean is Dr. G. W. Hubbard. Total registration for 1913-14 was 359; graduates, 73. The thirty-ninth session begins Sept. 9, 1914, and ends April 20, 1915.

TEXAS

Texas, population 3,096,542 has four medical colleges. The University of Texas Department of Medicine is located at Galveston, a city of 36,981 inhabitants. The Texas Christian University School of Medicine is at Fort Worth, population 73,312. The Baylor University College of Medicine and the Southern Methodist University Medical Department are situated in Dallas, population 92,104.

Dallas

BAYLOR UNIVERSITY COLLEGE OF MEDICINE, 720 College Avenue.—Organized in 1900 as the University of Dallas Medical Department. In 1903 it took its present name and became the Medical Department of Baylor University at Waco. It acquired the charter of Dallas Medical College in 1904. The first class graduated in 1901. The faculty numbers 46. Entrance requirement is one year of college work in addition to a four-year high school education. The course is four years of eight months each. The fees are \$115 each year; matriculation fee of \$5, paid in advance, \$15. The Dean is Dr. E. H. Cary. Total registration for 1913-14 was 50; graduates, 18. The fifteenth session begins Sept. 4, 1914, and ends May 31, 1915.

SOUTHERN METHODIST UNIVERSITY MEDICAL DEPARTMENT.—Organized in 1903 as the Southwestern University Medical College. Name changed as above in 1912. The first class graduated in 1904. It has a faculty of 13 professors and 25 instructors, assistants, etc., a total of 38. The course of instruction covers four years of eight months each. One year of collegiate work in addition to a four-year high school education is required for admission. The fees for the four years are, respectively, \$113, \$108, \$103 and \$125. The Dean is Dr. John O. McReynolds. Total registration for 1913-14 was 51; graduates, 17. The eleventh session begins Sept. 30, 1914, and ends June 3, 1915.

Fort Worth

TEXAS CHRISTIAN UNIVERSITY SCHOOL OF MEDICINE, Calloun and Fifth Streets.—Organized in 1894 as the Fort Worth School of Medicine, the Medical Department of the Fort Worth University. In 1912 the latter institution changed its name to Texas Christian University. The first class graduated in 1895. Became an integral part of Texas Christian University in 1913. It has a faculty of 19 professors and 38 lecturers, assistants, etc., in all 57. One year of collegiate work in addition to a four-year high school education is required for admission. The course covers four years of nine months each. The total fees for each of the four years, respectively, are \$114, \$113, \$108 and \$125. The Dean is Dr. I. C. Chase. The total registration for 1913-14 was 48; graduates, 11. The twenty-first session begins Sept. 8, 1914, and ends June 4, 1915.

Galveston

UNIVERSITY OF TEXAS DEPARTMENT OF MEDICINE, on the Strand, between Ninth and Tenth Streets.—Organized in 1891. The first class graduated in 1892. It has a faculty of 16 professors and 13 lecturers, a total of 29. The curriculum embraces four years of eight months each. The entrance requirement is one year of collegiate work in addition to a four-year high school education. The total fees for the four years, respectively, are \$75, \$50, \$27.50 and \$10. The Dean is Dr. William S. Carter. Total registration for 1913-14 was 172; graduates, 23. The twenty-fourth session begins Oct. 1, 1914, and ends May 31, 1915.

UTAH

Utah, population 373,351, has one medical college, the School of Medicine of the University of Utah, situated at Salt Lake City, which has 92,777 people.

To be eligible to secure licenses to practice medicine in Utah, students matriculating in and after the session of 1912-13, in addition to a four-year high school education, must have completed at least one year of collegiate work prior to beginning the study of medicine, this preliminary college work to have included college courses in physics, chemistry and biology.

Salt Lake City

UNIVERSITY OF UTAH SCHOOL OF MEDICINE.—Organized in 1906. Gives only first two years of the medical course. Each course covers thirty-six weeks. Two years of collegiate work are required for admission. The medical faculty consists of 10 professors and 9 lecturers and assistants, a total of 19. The fees are \$65 each year for residents and \$80 each year for non-residents. Total registration for 1913-14 was 20. The eighth session begins Sept. 14, 1914, and ends June 3, 1915.

VERMONT

Vermont, population 355,956, has one medical school, located at Burlington, a town of 20,468 people. Students matriculating in and after the session of 1912-13 who desire to practice medicine in Vermont, must have obtained a preliminary training of at least one year of collegiate work in addition to a standard four-year high school education, this additional year's work to include college courses in physics, chemistry and biology.

Burlington

UNIVERSITY OF VERMONT COLLEGE OF MEDICINE, Pearl Street, College Park.—Organized with complete course in 1822. Classes graduated in 1823 to 1826, inclusive, when the school was suspended. It was reorganized in 1853 and classes were graduated in 1854 and in all subsequent years. The faculty numbers 48. One year of college

work in addition to a standard four-year high-school education is required for admission. The course of study covers four years of nine months each. The total fees for each of the first three years are \$145, and \$175 for the fourth year. The Dean is Dr. H. C. Tinkham. The total registration for 1913-14 was 117; graduates, 39. The next session begins Sept. 23, 1914, and ends June 23, 1915.

VIRGINIA

Virginia, population 2,061,612, has two medical colleges, one, the Department of Medicine of the University of Virginia, situated in Charlottesville, population 6,765, and the Medical College of Virginia at Richmond, population 127,628.

Only graduates of Medical Colleges registered by the Virginia State Board of Medical Examiners are eligible to obtain licenses to practice medicine in this state. Medical colleges to be so registered must require of all students admitted in the sessions of 1914-15 and thereafter, completion of at least one year of collegiate work including college courses in physics, chemistry and biology, in addition to a standard four-year high-school education.

Charlottesville

UNIVERSITY OF VIRGINIA DEPARTMENT OF MEDICINE.—Organized in 1827. Classes were graduated in 1828 and in all subsequent years except 1865. It has a faculty of 14 professors and 21 lecturers, instructors, assistants, etc., a total of 35. The requirements for admission are the completion of a four years' high school course, or its equivalent, and a year of college work devoted to chemistry, physics and biology. Total fees each year are \$140. The Dean is Dr. R. H. Whitehead. The total registration for 1913-14 was 104; graduates 17. The eighty-sixth session begins Sept. 14, 1914, and ends June 16, 1915.

Richmond

MEDICAL COLLEGE OF VIRGINIA, Marshall and College Streets.—Organized in 1838 as the Medical Department of Hampden Sydney College. Present title was taken in 1854. In 1913 the University College of Medicine was merged. Classes were graduated in 1840 and in all subsequent years. It has a faculty of 46 professors and 77 lecturers, instructors, etc., a total of 123. The requirement for admission is a four-year high school education and in addition a full year of collegiate work. The course embraces four years of eight months each. Fees, \$164 for the first year and \$114 for each subsequent year; graduation fee, \$30. The Dean is Dr. Stuart McGuire. The total registration for 1913-14, 386; graduates, 88. The eighty-sixth session begins Sept. 15, 1914, and ends June 1, 1915.

WEST VIRGINIA

West Virginia, population 1,221,119, has one medical college, the School of Medicine of West Virginia University, which offers the first two years of the medical course. It is located at Morgantown, a city of 9,150 population.

Morgantown

WEST VIRGINIA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1902, and gives only the first two years of the medical course. One year of work in an approved college of liberal arts is required for admission. Session extend through nine months. The faculty numbers 11. Fees: For residents of the state, \$25 each year; for non-residents, \$50. The Dean is Dr. John N. Simpson. The total registration for 1913-14 was 21. The next session begins Sept. 14, 1914, and ends June 16, 1915.

WISCONSIN

Wisconsin, population 2,333,860, has two medical colleges, the Medical School of the University of Wisconsin, which teaches the first two years of the medical course, and is located at Madison, a city of 25,531 people, and the Marquette University School of Medicine, located at Milwaukee, a city of 373,857 people.

Madison

UNIVERSITY OF WISCONSIN MEDICAL SCHOOL.—Organized in 1907. Gives only the first two years of the medical course. For matriculation at least two years in a college of arts and science or an equivalent training are required, including two years of Latin, a reading knowledge of French and German, and at least a year's work in physics, chemistry and biology. It has a faculty of 11 professors and 14 lecturers, instructors, etc., a total of 25. Tuition fees: For residents of the state, \$70 each year; for non-residents, \$170. The Dean is Dr. Charles R. Bardeen. The registration for 1913-14 was 83. The seventh session begins Sept. 23, 1914, and ends June 18, 1915.

Milwaukee

MARQUETTE UNIVERSITY SCHOOL OF MEDICINE, Fourth Street and Reservoir Avenue.—Organized in December, 1912, by the merger of the Milwaukee Medical College and the Wisconsin College of Physicians and Surgeons. It has a faculty of 37 professors and 79 assistants, instructors, etc., a total of 116. The entrance requirements include, in addition to a four-year high school education, one year of college work, including courses in physics, chemistry, biology and a modern language. After Jan. 1, 1915, two years of college work will be required. The curriculum is for four years for thirty-four weeks each. The total fees for the four years, respectively, are \$180, \$175, \$175 and \$175. The Dean is Dr. Louis F. Jermain. The registration for 1913-14 was 169, graduates 43. The third session begins Oct. 1, 1914, and ends June 17, 1915.

PHILIPPINE ISLANDS

The Philippine Archipelago, having a population of 7,635,436, has two medical colleges, the University of the Philippines College of Medicine and Surgery and the Medical Faculty of the University of St. Thomas. They are located in the city of Manila, which in 1903 had a population of 219,928.

Manila

UNIVERSITY OF THE PHILIPPINES COLLEGE OF MEDICINE AND SURGERY, Manila.—Organized in 1907 as the Philippine Medical School, under the support of the government of the Philippine Islands. Present title in 1910. The faculty includes 22 professors and 44 lecturers, assistants, etc., a total of 66. Two years of collegiate work leading to the degree of Bachelor of Arts are required for admission. The course extends over five years of nine months each with an additional sixth year of intern service. The Dean is Dr. William E. Musgrave. The total registration for 1913-14 was 82, graduates 9. The eighth session begins July 1, 1914, and ends March 30, 1915.

CANADA

The Dominion of Canada has nine medical colleges, all but one of which require a five-year course, including in the first-year courses in physics, chemistry and biology. This course is practically equal to that in the colleges of the United States which require one year of college work for admission, including the science courses named. None of the Canadian colleges has a fixed minimum requirement of two years of collegiate work, or its equivalent, preliminary to or as a part of the medical course. A new medical school at Edmonton, Alberta gives only the first two years of the medical course, including the preliminary science year.

Alberta

UNIVERSITY OF ALBERTA, FACULTY OF MEDICINE, Edmonton.—Organized in 1913. Offers only the first two years of the medical course, including the preliminary science year. The faculty numbers 7. Fees for the first year are \$50; for the second, \$75. The registrar is Cecil E. Race, B.A. The registration for 1913-14 was 26. The second session begins Sept. 30, 1914, and ends May 12, 1915.

Manitoba

MANITOBA MEDICAL COLLEGE, Winnipeg.—It is the Medical Faculty of the University of Manitoba. Organized in 1883, first class graduated in 1886 and a class graduated each subsequent year. The faculty numbers 58. The fees are \$155 for the first year and \$150 for each subsequent year. The entire course covers five years, the first year including courses in physics, chemistry and biology. The Dean is Dr. H. H. Chown, 263 Broadway, Winnipeg. Total registration for 1913-14 was 188, graduates, 43. The next session begins Sept. 21, 1914, and ends May 1, 1915.

Nova Scotia

DALHOUSIE UNIVERSITY, FACULTY OF MEDICINE, Halifax, N. S.—Organized in 1867. Incorporated as the Halifax Medical College in 1875. Reorganized as an examining faculty, separate from the Halifax Medical College in 1885. In 1911, in accordance with an agreement between the Governors of Dalhousie University and the Corporation of the Halifax Medical College, the work of the latter institution was discontinued and a full teaching faculty was established by the University. By an arrangement between Dalhousie University and the Provincial Medical Board of Nova Scotia, the final professional examinations are conducted conjointly by the University and the Board, and candidates may qualify at the same time for their academic degrees and the provincial license. First class graduated in 1872. It has a faculty of 37 professors, lecturers and demonstrators. Requires matriculation examination and a graded course of five years, including preliminary courses in physics, chemistry and biology. Fees are \$100 each year. Total registration for 1913-14 was 75, graduates, 15. The Secretary is Dr. A. W. H. Lindsay, 319 Pleasant Street, Halifax, N. S. The next session begins Sept. 9, 1914, and ends May 6, 1915.

Ontario

UNIVERSITY OF TORONTO, FACULTY OF MEDICINE, Toronto.—Organized in 1843 as the Medical Faculty of King's College. Abolished in 1853. Reestablished in 1887. In 1903 it absorbed Trinity Medical College. The course of study covers five years of eight months each, the first year including courses in physics, chemistry and biology. It has a faculty of 54 professors and 129 lecturers, associates, etc., a total of 183. The fees are \$150 each year. The Secretary is Dr. A. Primrose. The total registration for 1913-14 was 554, graduates, 85. The next session begins Sept. 29, 1914, and ends May 29, 1915.

QUEEN'S UNIVERSITY FACULTY OF MEDICINE, Kingston.—Organized 1854, first class graduated in 1855, and a class graduated each subsequent year. The faculty was originally a department of the University, but a separation took place in 1866, when the school was conducted under the charter of the Royal College of Physicians and Surgeons at Kingston. In 1892 the school again became an integral part of Queen's University. The faculty includes 25 professors and 14 assistants, instructors, etc., a total of 39. The fees amount to \$105 each year; fee for M.D., C.M. degrees, \$30. The course covers five years of seven months each, the first year including courses in physics, chemistry and biology. The total registration in 1913-14 was 268; graduates, 50. The Dean is Dr. J. C. Connell. The next session begins Sept. 14, 1914, and ends April 28, 1915.

WESTERN UNIVERSITY, FACULTY OF MEDICINE, London.—Organized in 1881, first class graduated in 1883 and a class graduated each year subsequently. The faculty numbers 37. The course is five years of eight months each, the first year including courses in physics, chemistry and biology. The tuition is \$110 each year. The Registrar is Dr. W. E. Vaughn. Total registration for 1913-14 was 90, graduates, 27. The next session begins Oct. 1, 1914, and ends June 5, 1915.

Montreal

MCGILL UNIVERSITY, FACULTY OF MEDICINE.—Founded 1824 as Montreal Medical Institution; became the Medical Faculty of McGill University in 1829; first class graduated under the university auspices in 1833. No session between 1836-39 owing to political troubles. In 1905 it absorbed the Faculty of Medicine of the University of Bishop College. The course extends over five years of eight months each, including the preliminary year devoted to physics, chemistry and biology. The faculty numbers 120. The total fees are \$164 for each of the first four years and \$191 for the fifth. The total registration for 1913-14 was 382, graduates, 63. The Registrar is Dr. John W. Seane. The next session begins Oct. 1, 1914, and ends June 8, 1915.

MONTREAL SCHOOL OF MEDICINE AND SURGERY, Montreal.—Organized in 1878 as the Medical Department of Laval University. Present name assumed in 1911. First class graduated in 1879. The faculty numbers 60. The course extends over five years, including preliminary courses in physics, chemistry and biology. The Dean is Dr. E. P. Lachapelle. The total registration for 1913-14 was 132, graduates, 22. The next session begins Oct. 1, 1914, and ends June 20, 1915.

Quebec

LAVAL UNIVERSITY MEDICAL DEPARTMENT, Quebec.—The Quebec School of Medicine, organized in 1848, became in 1852 Medical Department of Laval University; first class graduated in 1855, and a class graduated each subsequent year. The faculty numbers 24. The fees are \$60 each year. The course extends over five years, the first year including courses in physics, chemistry and biology. The Dean is Dr. Michael Joseph Ahren, Quebec. Total registration for 1913-14 was 88, graduates, 14. The next session begins Sept. 9, 1914, and ends June 1, 1915.

STANDARDS OF THE COUNCIL ON MEDICAL EDUCATION OF THE AMERICAN MEDICAL ASSOCIATION

Essentials of an Acceptable Medical College

(Revised to August 10, 1914)

The following outline of the essentials of an acceptable medical college was issued by the Council on Medical Education of the American Medical Association for its suggestive value in the rapid development in progress among the medical colleges in the United States. It also represents the basis on which medical colleges are rated in the Council's classifications.

ADMISSION OF STUDENTS

1. A strict enforcement of the following standards and requirements, the college itself to be held responsible for any instances in which they are not enforced.

[Since the product of the medical school depends largely on the quality of the students admitted, in rating medical colleges, special emphasis is laid by the Council on the strictness and honesty by which the standards of admission and advanced standing are administered. By the admission of unfit students the school is handicapped from the very beginning and, in the opinion of the Council, deserves a low rating regardless of its equipment, its clinical facilities and its teaching force.]

2. A requirement for admission of at least a four-year-high-school education, and in addition at least one year of college work, including at least eight semester hours each of physics, chemistry and biology of college grade and a reading knowledge of German or French.

3. These minimum requirements for admission to the study of medicine are set forth in the following statements relating (1) to the high school work and (2) to the work of the preliminary college year. The prescribed minimum of work in physics, chemistry, biology and German or French should be required by every medical school whether given in a preliminary year by the medical school itself or required in one or more years of collegiate work. The statements are as follows:

ADMISSION TO THE PRELIMINARY COLLEGE YEAR

(a) For admission to the preliminary college year, students must have completed a four-year course of at least fourteen units in a standard accredited high school or other institution of standard secondary school grade, or have its equivalent as demonstrated by an examination. A transcript of the student's work should be secured direct from the principal of the secondary school by the college authorities and kept on file. This evidence of actual attendance at the secondary school or schools should be obtained for every student no matter whether he is admitted by examination or on presentation of acceptable credentials.

(b) The subjects for which credits for admission to the preliminary college year may be accepted are shown in the following schedule:

SCHEDULE OF SUBJECTS OFFERED IN ACADEMIC AND SECONDARY SCHOOLS, CREDITS IN WHICH ARE ACCEPTABLE FOR ENTRANCE TO THE PRELIMINARY COLLEGE YEAR LEADING TO THE MEDICAL COURSES

ENGLISH	SUBJECTS	UNITS	REQUIRED	ELECTIVE
	READING AND PRACTICE.....	2	2	
	Study and Practice.....	1	...	1
MATHEMATICS				
	ALGEBRA TO QUADRATICS.....	1	1	...
	Algebra (Quadratic Equations, Binomial Theorem and Progressions).....	1/2	...	1/2
	PLANE GEOMETRY.....	1	1	...
	Solid Geometry.....	1/2	...	1/2
	Trigonometry.....	1/2	...	1/2
LATIN				
	GRAMMAR AND COMPOSITION.....	1	*	1
	CAESAR.....	1	*	1
	Cicero.....	1	...	1
	Virgil.....	1	...	1
	Cornelius Nepos.....	1	...	1
Greek				
	Grammar and Composition.....	1	*	1
	Xenophon.....	1	...	1
	Homer.....	1	...	1
GERMAN (OR FRENCH)				
	ELEMENTARY.....	2	2*	...
	Intermediate.....	1	...	1
Spanish				
	Elementary.....	2	...	2
Scandinavian				
	Elementary.....	2	...	2
HISTORY				
	AMERICAN HISTORY AND CIVIL GOVERNMENT.....	1	1	...
	Greek and Roman History.....	1	...	1
	Medieval and Modern History.....	1	...	1
	English History.....	1	...	1
Science †				
	Botany and Zoology, each.....	1	...	1
	or Biology.....	1	...	1
	Chemistry.....	1	...	1
	Physics.....	1	...	1
	Physiography.....	1/2	...	1/2
	Physiology.....	1/2	...	1/2
Agriculture		1	...	1
Drawing		1	...	1
Manual Training		1	...	1
Domestic Science		1	...	1
Music		1	...	1
	Appreciation or Harmony.....	1	...	1
Total		35 1/2	7	28 1/2

A unit is the credit value of at least 36 weeks' work of 4 or 5 recitation periods per week, each recitation period to be of not less than 40 minutes. In other words, a unit represents a year's study in any subject in a secondary school constituting approximately a quarter of a full year's work. A satisfactory year's work in any subject cannot be accomplished under ordinary circumstances in less than 120 sixty-minute hours, or their equivalent.

Required Branches: Of the 14 units of high-school work it is suggested that the subjects in capitals aggregating 7 units be required. Other work to the amount of at least 7 units may be made up from any of the other subjects of the above schedule.

* Two units of Greek or Latin may be substituted for the two required units of French or German.

† Credentials of each science course should include evidence of laboratory work.

WORK OF THE PRELIMINARY COLLEGE YEAR

(c) The preliminary college year shall extend through one college session of at least thirty-two weeks of actual instruction, including final examinations.

(d) In excellence of teaching and in content, the work of this preliminary college year shall be at least equal to the work done in the freshman year in standard colleges and universities.

(e) This preliminary college year shall include courses in physics, chemistry, biology and German or French, each course to embrace at least eight semester hours of didactic and laboratory work in each subject as shown in the accompanying schedule, provided that a student may satisfy the requirement of physics in presenting one unit of high-school physics and completing a half year of college physics which continues and does not duplicate the work done in the high school.

(f) If a satisfactory "reading knowledge" of German or French is to be obtained in the one year of college work it is essential that an advanced course be offered and that the student have completed as a prerequisite in the high school two units of elementary work in German or French.

(g) By requiring two years of collegiate work for admission, medical schools would have a greater latitude in the acceptance of high-school credentials. For example, the language requirement in the high school would not be so essential since the deficiency could easily be made up in the two years of collegiate work.

(h) "College work" cannot be considered as acceptable unless it has been preceded by a completed course of study in a standard four-year secondary school or its full educational equivalent.

(i) Credits for two or more years of collegiate work cannot be considered acceptable unless courses in physics, chemistry and biology have been completed. It is urged that a reading knowledge of German or French also be required.

(j) Medical colleges giving these science courses in a premedical year, should provide expert full-time teachers in the various subjects, should provide laboratory equipment sufficient to enable the student to do the work intelligently and should provide a training in the subjects no less thorough than that given in standard colleges of liberal arts.

(k) Postgraduate courses given in high schools by high-school teachers cannot as a rule be considered equal to college courses given by college teachers.

SCHEDULE

Subject	Lectures or Recitations Per Week	Laboratory Periods* Per Week	Total Hours Per Semester	Total Semester Hours Per Year
Physics, 1....	2	2	4	8
Chemistry, 1..	2	2	4	8
Biology, 1....	2 or 3	2 or 1	4	8
German or French, 2...	4 or 3	.....	4 or 3	8 or 6
Total	10	6 or 5	16 or 15	32 or 30

* Each laboratory period must extend over at least two hours.

OR, EXPRESSED IN CLASS HOURS

Subject	Total Hours Lectures, or Recitations	Total Hours Laboratory Work	Total Minimum Hours Didactic and Laboratory
Physics, 1....	64	128	192
Chemistry, 1..	64	128	192
Biology, 1....	64 or 96	128 or 64	192 or 160
German or French, 2..	128 or 96	.....	128 or 96
Totals	320	384 or 320	704 or 640

(l) A year of work in a college of dentistry or a college of pharmacy should not as a rule be considered as an equivalent of the required premedical college science year.

(m) The object of the work of the preliminary college year is to provide the student with a training that will enable him to enter more readily and intelligently on the study of the fundamental medical sciences in the medical school.

4. Entrance Conditions. (a) During the next few years (until 1917) candidates who have completed at least one year of work in an approved college of liberal arts may be admitted conditioned in one-half of the required course in physics or one-half of the course in a modern language, these conditions to be removed before the beginning of the work of the second medical year.

(b) Candidates who have completed two or more years of work in an approved college of liberal arts may be admitted conditioned in all of the required course in physics or all of the course in a modern language, these conditions to be removed before the beginning of the second medical year.

(c) Candidates holding baccalaureate degrees from approved colleges of liberal arts but who have not taken the required courses in physics, chemistry or biology, may be admitted conditioned in those subjects, such conditions to be removed before entering on the work of the second medical year.

So far as possible, however, all deficiencies should be removed during the summer preceding entrance to the freshman medical year and the summer between the first and second medical years.

5. The college should require that students be in actual attendance in the college within the first week of each annual session and thereafter.

6. Actual attendance at classes should be insisted on except for good cause, such as for sickness, and under no circumstances should credit be given for any course where the attendance has been less than 80 per cent. of the full time.

7. (a) Full advanced standing may be granted to students only for work done in other acceptable colleges and in granting advanced standing there should be no discrimination against the college's full-course students. (b) In *exceptional cases* students from Class B medical schools may be given advanced standing but not higher than entrance to the third year (junior) class and no credit should be given in any subject except on the recommendation of the head of the department teaching that subject. (c) In *exceptional cases* students from Class C colleges may be given advanced standing but not higher than entrance to the second year (sophomore) class and then only after thorough examinations in all first year subjects have been passed.

SUPERVISION, EQUIPMENT, TEACHERS

8. There should be careful and intelligent supervision of the entire school by a dean or other executive officer who holds, and has sufficient authority to carry out fair ideals of medical education as interpreted by modern knowledge.

9. There should be a good system of records showing conveniently and in detail the credentials, attendance, grades and accounts of the students by means of which an exact knowledge can be obtained regarding each student's work. Records should also be kept showing readily the attendance of patients at the teaching hospitals and dispensaries; the maternity cases attended by students and the post-mortem cases used in teaching.

10. The college should have a fully graded course covering four years of at least 32 weeks each, exclusive of time required for matriculation and holidays, and at least 30 hours per week of actual work; this course should be clearly set forth in a carefully prepared and printed schedule of lectures and classes.

(a) The college should give two years of work consisting largely of laboratory work in thoroughly equipped laboratories in anatomy, histology, embryology, physiology, chemistry (inorganic, organic and physiologic), bacteriology, pathology, pharmacology, therapeutics and clinical diagnosis. Present day medical knowledge makes it quite essential that these subjects be in charge of full-time, thoroughly trained teachers.

(b) Two years of clinical work largely in hospitals and dispensaries, with thorough courses in internal medicine (including physical diagnosis, pediatrics, nervous and mental diseases), surgery (including surgical anatomy and operative surgery on the cadaver), obstetrics, gynecology, laryngology, rhinology, ophthalmology, otology, dermatology, hygiene and medical jurisprudence.

(c) As soon as conditions warrant, a fifth undergraduate year should be required which should be spent by the student as an intern in an approved hospital.

11. The college should provide at least six expert, thoroughly trained professors in the laboratory branches, salaried so that they may devote their entire time to instruction and to that research without which they cannot well keep up with the rapid progress being made in their subjects. These professors should have a definite responsibility in the conduct of the college, and their first and chief interest should be the training of medical students. It is advised that four of these professors be placed in charge of the departments of (a) anatomy, (b) physiology, (c) pathology and bacteriology and (d) physiologic chemistry and pharmacology. The other two may be assigned one to the laboratory course in histology and embryology under the department of anatomy and the other to the department

of pathology and bacteriology, possibly to the course in laboratory clinical diagnosis. There should also be a sufficient number of assistants in each department to look after the less important details. For colleges having sixty students or less in each class, there should be at least one full-time salaried assistant for each of the four departments mentioned, and at least one additional assistant in each of these departments should be provided for each additional thirty students enrolled. This represents a low average of the full-time assistants already employed by the accepted medical colleges.

12. The faculty should be thoroughly organized and should be made up of graduates of institutions recognized as medical colleges and who have had a training in all departments of medicine. Non-medical men should be selected as teachers in medical schools only under exceptional circumstances and only because medical men of equal special capacity are not available. All faculty members should be appointed because of their ability as teachers and not because they happen to be on the attending staff of a hospital or for other like reasons.

CLINICAL FACILITIES

13. The college should own or entirely control a hospital in order that students may come into close and extended contact with patients under the supervision of the attending staff. This hospital should be in close proximity to the college and have a daily average (for senior classes of 100 students or less) of not less than 200 patients which can be utilized for clinical teaching, these patients to be of such character as to permit the student to see and study the common variety of surgical and medical cases as well as a fair number in each of the so-called specialties.

14. The college should also have ample hospital facilities for children's diseases, contagious diseases and nervous and mental diseases.

15. At least six maternity cases should be provided for each senior student, who should have actual charge of these cases under the supervision of the attending physician. Careful records of each case should be handed in by the student.

16. Facilities should be provided for at least 30 necropsies during each college session which are attended and can be participated in by senior students (for senior classes of 100 students or less).

17. The college should own or control a dispensary, or outpatient department, the attendance to be a daily average of 60 cases (for senior classes of 100 students or less), the patients to be carefully classified, good histories and records of the patients to be kept and the material to be well used. The attending staff should be made up of good teachers, should be well organized and be regular in attendance.

OTHER TEACHING FACILITIES

18. The college should have a working medical library to include the more modern text and reference books with the *Index Medicus* and 30 or more leading medical periodicals; the library room should be properly lighted and heated, and easily accessible to students during all or the greater part of the day; it should be equipped with suitable tables and chairs, and have a librarian in charge.

19. A working medical museum having its various anatomic, embryologic, pathologic and other specimens carefully prepared, labeled and indexed so that any specimen may be easily found and employed for teaching purposes. It is suggested that so far as possible with each pathologic specimen coming from post-mortems there also be kept the record of the post-mortem, the clinical history of the patient on whom the necropsy was held and microscopic slides showing the equivalent structures of the disease shown in the gross specimen of the same.

The principal one should be sufficient dissecting material to enable and kept on an individually to dissect at least the lateral half secondary school cadaver; to provide cross-sections and other student no matter material and to allow of a thorough course for on presentation of a live surgery on the cadaver.

21. For modern experimental laboratory work in physiology, pharmacology and bacteriology as well as for a reasonable amount of medical research, a supply of animals—frogs, turtles, rabbits and guinea-pigs, if not also cats and dogs—is essential. Proper provision, also, is necessary for the housing and care of such animals. In any use made of animals great care should be used to prevent needless suffering and work by students should be carefully supervised.

22. A supply of such useful auxiliary apparatus as a stereopticon, a reflectoscope, carefully prepared charts, embryologic or other models, manikins, dummies for use in bandaging, a Roentgen ray and other apparatus now so generally used in medical teaching.

23. The college should show evidences of thorough organization and of reasonably modern methods in all departments and evidences that the equipment and facilities are being intelligently used in the training of medical students.

24. A clear statement of the college's requirements for admission, tuition, time of attendance on the classes, sessions, courses offered and graduation should be clearly set forth, together with complete classified lists of its matriculants and latest graduating class in regular annual catalogues or announcements.

By vote of the House of Delegates of the American Medical Association the Council on Medical Education has been given special instructions at various times as follows:

(a) Not to rate higher than Class C any medical college which gives the major portion of its instruction after four o'clock in the afternoon (Atlantic City, June, 1907).

(b) To include in Class A only such medical colleges as required for admission, in addition to an accredited four-year high school course, at least one year of college credits in physics, chemistry and biology (Atlantic City, June, 1912). In 1914 (June, Atlantic City), it was emphasized that the courses in physics, chemistry and biology to be acceptable should be of college grade.

(c) No college is to be rated higher than Class C which is conducted as a stock corporation in the interests of the stockholders. (Atlantic City, June, 1914.)

NOTE.—Correspondence from medical colleges regarding any of the above requirements is invited, and any further suggestions or information available will be gladly furnished.

Definitions of a Medical College* and a Medical School†

"An institution to be ranked as a medical college must have at least (6) professors giving their entire time to medical work, a graded course of four full years of college grade in medicine, and must require for admission not less than the usual four years of academic or high-school preparation, or its equivalent, in addition to the preacademic or grammar school studies."

By a medical school as differentiated from a medical college is meant a part of a university requiring for admission two years of collegiate work, or its equivalent, and offering instruction of not less than two years' duration, leading to the degree of Doctor of Medicine.

Grading of Medical Colleges

As in the previous classifications, all medical colleges were rated by the Council on Medical Education on a civil service basis on a scale of 1,000 points. The data relating to each college were grouped under ten general heads in such manner that the groups would have as nearly equal weight as possible, each group, allowing a possible 100 points (10 per cent.) out of a possible 1,000 points (100 per cent.). The ten heads under which the data were arranged are as follows:

1. Showing of graduates before state boards and other evidences of the training received.
2. Enforcement of a satisfactory preliminary educational requirement, granting of advanced standing and the character of records.
3. Character of curriculum, grading of course, length of session, time allowed for matriculation and supervision.
4. Medical school buildings; light, heat, ventilation, cleanliness.
5. Laboratory facilities and instruction.
6. Dispensary facilities and instruction.

* This definition of a college is based on that given in the revised ordinances of the state of New York. It has been adopted also by the Carnegie Foundation for the Advancement of Teaching.
† Based on the definition of the term "school" adopted in 1909 by the Association of American Universities.

7. Hospital facilities and instruction, maternity work, autopsies, specialties.
8. Faculty, number and qualifications of trained teachers, full-time instructors, and assistants, especially of the laboratory branches, organization, and extent of research work.
9. Extent to which the school is conducted for properly teaching the science of medicine rather than for the profit of the faculty directly or indirectly.
10. Possession and use made of libraries, museums, charts, stereopticons, etc.

Class A+ colleges are those which are acceptable; Class A those which need improvement in certain respects, but which are otherwise acceptable; Class B, those which, under their present organization, might be made acceptable by general improvements, and Class C, those which require a complete reorganization to make them acceptable.

Third Classification of Medical Colleges

Revised to June 21, 1914

CLASS A PLUS—ACCEPTABLE MEDICAL COLLEGES

1. Giving an Acceptable Four-Year Course:

CALIFORNIA

Leland Stanford Junior Univ., School of Med..San Francisco
University of California, College of Medicine.....
.....San Francisco-Los Angeles

CONNECTICUT

Yale Medical School.....New Haven

ILLINOIS

Northwestern University Med. School.....Chicago
Rush Medical College (University of Chicago).....Chicago

INDIANA

Indiana University School of Medicine.....
.....Bloomington-Indianapolis

IOWA

State Univ. of Iowa, Coll. of Med.....Iowa City

LOUISIANA

Tulane University of Louisiana, School of Med..New Orleans

MARYLAND

Johns Hopkins University, Medical Department...Baltimore

MASSACHUSETTS

Medical School of Harvard University.....Boston

MICHIGAN

University of Michigan, Dept. of Med. and Surg..Ann Arbor

MINNESOTA

University of Minnesota Medical School.....Minneapolis

MISSOURI

Washington University Medical School.....St. Louis

NEBRASKA

University of Nebraska, College of Medicine³..... Omaha

NEW YORK

Columbia University, College of Phys. and Surgs.....

.....New York City

Cornell University Medical College.....New York City

University and Bellevue Hospital Medical College.....

.....New York City

Syracuse University, College of Medicine.....Syracuse

OHIO

Medical College of the University of Cincinnati...Cincinnati

Ohio State University, College of Medicine³.....Columbus

Western Reserve University, School of Medicine...Cleveland

PENNSYLVANIA

Jefferson Medical College².....Philadelphia

University of Pennsylvania, School of Medicine.Philadelphia

University of Pittsburgh, School of Medicine²....Pittsburgh

TENNESSEE

Vanderbilt University, Medical Department¹.....Nashville

TEXAS

University of Texas, Department of Medicine.....Galveston

VIRGINIA

University of Virginia, Dept. of Med.....Charlottesville

2. Giving a Two-Year Course Acceptably:

MISSOURI

University of Missouri, School of Medicine.....Columbia

WISCONSIN

University of Wisconsin Medical School.....Madison

Total 29

CLASS A—COLLEGES ALSO ACCEPTABLE WHICH COULD MAKE CERTAIN IMPROVEMENTS TO ADVANTAGE

1. Giving a Complete Four-Year Course:

ALABAMA

University of Alabama, School of Medicine.....Mobile

COLORADO

University of Colorado, School of Med.....Boulder-Denver

DISTRICT OF COLUMBIA

Georgetown University, School of Medicine.....Washington

George Washington University, Med. School....Washington

Howard University, School of Medicine.....Washington

GEORGIA

Atlanta Medical College³.....Atlanta

University of Georgia, Medical Dept.⁴.....Augusta

ILLINOIS

University of Illinois, College of Medicine.....Chicago

IOWA

State Univ. of Iowa, Coll. of Homeopathic Med...Iowa City

KANSAS

University of Kansas, School of Med.....Lawrence-Rosedale

KENTUCKY

University of Louisville, Medical Department.....Louisville

MAINE

Medical School of Maine.....Brunswick-Portland

MARYLAND

College of Physicians and Surgeons.....Baltimore

University of Maryland, School of Medicine.....Baltimore

MASSACHUSETTS

Boston University School of Medicine.....Boston

Tufts College Medical School.....Boston

MICHIGAN

Detroit College of Medicine and Surgery⁵.....Detroit

University of Michigan, Homeopathic Med. Coll..Ann Arbor

MISSOURI

St. Louis University School of Medicine.....St. Louis

NEW YORK

Albany Medical College.....Albany

Fordham University, School of Medicine³....New York City

Long Island College Hospital⁵.....Brooklyn

New York Homeopathic Medical College and Flower

Hospital.....New York City

University of Buffalo, Medical Department.....Buffalo

OREGON

University of Oregon, Department of Medicine....Portland

PENNSYLVANIA

Hahnemann Medical College and Hospital.....Philadelphia

Medico-Chirurgical College of Philadelphia.....Philadelphia

Woman's Medical College of Pennsylvania.....Philadelphia

1. Rating changed to Class A+ June 21, 1914.

2. Rating changed to Class A+ Feb. 24, 1914.

3. Rating changed to Class A Feb. 24, 1914.

4. Rating changed to Class A Feb. 24, 1913.

5. Rating changed to Class A June 21, 1914.

TENNESSEE

University of Tennessee, College of Medicine⁶.....Memphis

VERMONT

University of Vermont, College of Medicine.....Burlington

VIRGINIA

Medical College of Virginia.....Richmond

2. Giving a Two-Year Course:

MISSISSIPPI

University of Mississippi, Department of Medicine...Oxford

NEW HAMPSHIRE

Dartmouth Medical School.....Hanover

NORTH CAROLINA

University of North Carolina, School of Medicine..Chapel Hill

Wake Forest College, School of Medicine.....Wake Forest

NORTH DAKOTA

University of North Dakota, School of Medicine..University

SOUTH DAKOTA

University of South Dakota, College of Medicine...Vermilion

UTAH

University of Utah, School of Medicine.....Salt Lake City

Total 38

CLASS B—COLLEGES NEEDING GENERAL
IMPROVEMENTS TO BE MADE
ACCEPTABLE

1. Giving a Complete Four-Year Course:

ALABAMA

Birmingham Medical College⁶.....Birmingham

ARKANSAS

University of Arkansas, Medical Department.....Little Rock

CALIFORNIA

College of Physicians and Surgeons.....Los Angeles

Hahnemann Medical College of the Pacific....San Francisco

Oakland College of Medicine and Surgery.....Oakland

ILLINOIS

Bennett Medical College.....Chicago

Chicago College of Medicine and Surgery.....Chicago

Hahnemann Medical College and Hospital.....Chicago

NEBRASKA

John A. Creighton Medical College.....Omaha

NORTH CAROLINA

North Carolina Medical College⁷.....Charlotte

OHIO

Eclectic Medical College.....Cincinnati

OKLAHOMA

Univ. of Oklahoma, School of Med..Norman-Oklahoma City

PENNSYLVANIA

Temple University, Department of Medicine....Philadelphia

SOUTH CAROLINA

Medical College of the State of South Carolina⁸....Charleston

TENNESSEE

Lincoln Memorial University, Medical Dept.⁹.....Knoxville

Meharry Medical College¹⁰.....Nashville

6. Will offer only a postgraduate course after the class of 1915 has graduated.
7. Has merged with the Medical College of Virginia at Richmond, but will retain a nominal existence until it has granted the degrees for the three remaining classes which will receive the balance of their medical instruction at Richmond. Rating changed to Class B June 21, 1914.
8. Rating changed to Class B Feb. 24, 1913.
9. Has merged with the University of Tennessee, College of Medicine at Memphis. The three remaining classes will be taught at Memphis, but the degrees will be granted by the Lincoln Memorial University. Rating changed to Class B June 21, 1914.
10. Rating changed to Class B Feb. 24, 1914.

TEXAS

Baylor University, College of Medicine.....Dallas

Texas Christian University, School of Medicine¹¹.Fort Worth

Southern Methodist University, Medical Dept.¹¹.....Dallas

WISCONSIN

Marquette University, School of Medicine.....Milwaukee

2. Giving a Two-Year Course:

NORTH CAROLINA

Leonard Medical School¹².....Raleigh

WEST VIRGINIA

West Virginia University School of Medicine...Morgantown

Total 22

CLASS C—COLLEGES REQUIRING A COMPLETE
REORGANIZATION TO MAKE THEM
ACCEPTABLE

CALIFORNIA

California Eclectic Medical College.....Los Angeles

College of Physicians and Surgeons.....San Francisco

College of Medical Evangelists.....Loma Linda

GEORGIA

Georgia College of Eclectic Medicine and Surgery....Atlanta

Southern College of Med. and Surgery¹³.....Atlanta

ILLINOIS

Chicago Hospital College of Medicine.....Chicago

Jenner Medical College.....Chicago

MARYLAND

Eastern University School of Medicine¹⁴.....Baltimore

Maryland Medical College¹¹.....Baltimore

MASSACHUSETTS

College of Physicians and Surgeons¹⁵.....Boston

MISSOURI

American Medical College.....St. Louis

Eclectic Medical University¹⁶.....Kansas City

Ensworth Medical College.....St. Joseph

Kansas City Hahnemann Medical College.....Kansas City

St. Louis College of Physicians and Surgeons.....St. Louis

NEBRASKA

Cotner University Medical College.....Lincoln

NEW YORK

New York Med. Coll. and Hosp. for Women..New York City

OHIO

Cleveland-Pulte Medical College.....Cleveland

Toledo Medical College.....Toledo

TENNESSEE

University of West Tenn. Coll. of Med. and Surg...Memphis

Total 20

Note.—Official statements from the following state licensing boards indicate that as a rule the colleges rated in Class C are not recognized:

Alabama	Maryland (Reg.)	Pennsylvania
Arkansas (Reg.)	Michigan	Porto Rico
Colorado	Minnesota	Rhode Island
Connecticut (Reg.)	Mississippi	South Carolina
Delaware	New Hampshire	South Dakota
Florida	New Jersey	Texas
Georgia	New Mexico	Vermont
Indiana	New York	Virginia
Iowa	North Dakota	West Virginia
Kentucky	Ohio	Wisconsin
Louisiana (Reg.)	Oklahoma	

Of the above states the boards of New Hampshire, Rhode Island and Virginia recognize only the medical colleges listed in Classes A+ and A.

11. Rating changed to Class B May 10, 1914.
12. Has discontinued clinical teaching, hereafter to give only two years of the medical course. Rating changed to Class B June 21, 1914.
13. Reported not recognized by the Georgia State Board of Medical Examiners.
14. Reported not recognized by the Maryland State Board of Medical Examiners.
15. Reported not recognized by the Massachusetts Medical Society.
16. Reported not recognized by the Missouri State Board of Health.

State Requirements of Higher Preliminary Education

There are now twenty states which have adopted requirements of preliminary education in addition to a standard four-year high-school education. These states, the number of college years required and the time the higher requirement becomes effective are as follows:

State Examining Board of—	Number of Years Required	Affects Students Matriculating	Affects All Applicants
Minnesota	2	1908-09	1912
North Dakota	2	1908-09	1912
Colorado	2	1910-11	1914
Connecticut	1	1910-11	1914
Kansas	2	1910-11	1914
Indiana	1	1910-11	1914
Utah	1	1910-11	1914
Iowa	2	1911-12	1915
South Dakota	2	1911-12	1915
Vermont	1	1912-13	1916
Illinois	1	1914-15	1918
Kentucky	1	1914-15	1918
Michigan	1	1914-15	1918
New Hampshire	1	1914-15	1918
Pennsylvania	1	1914-15	1918
Rhode Island	1	1914-15	1918
Virginia	1	1914-15	1918
Alabama	2	1915-16	1919
Arkansas	1	1915-16	1919
California	1	1915-16	1919

Colleges Having Higher Entrance Requirements

The thirty-four medical schools which are now requiring as a minimum for entrance *two or more years* of work in a college of liberal arts in addition to a four-year high-school education are as follows:

	Requirement Began
CALIFORNIA	
Leland Stanford Junior University, School of Medicine.....	1909
University of California, College of Medicine.....	1905
COLORADO	
University of Colorado, School of Medicine	1910
CONNECTICUT	
Yale Medical School	1909
DISTRICT OF COLUMBIA	
Georgetown University, School of Medicine.....	1912
Howard University, School of Medicine	1914
ILLINOIS	
Northwestern University Medical School	1911
Rush Medical College (University of Chicago)	1904
University of Illinois, College of Medicine	1914
INDIANA	
Indiana University, School of Medicine	1910
IOWA	
State University of Iowa, College of Medicine.....	1910
State University of Iowa, Coll. of Homeopathic Medicine.....	1910
KANSAS	
University of Kansas, School of Medicine.....	1909
MARYLAND	
Johns Hopkins University, Medical Department.....	1893
MASSACHUSETTS	
Medical School of Harvard University	1900
MICHIGAN	
University of Michigan, Department of Medicine and Surgery....	1909
MINNESOTA	
University of Minnesota Medical School	1907
MISSOURI	
University of Missouri, School of Medicine.....	1910
Washington University Medical School	1912
NEBRASKA	
University of Nebraska, College of Medicine	1909
NEW HAMPSHIRE	
Dartmouth Medical School	1910
NEW YORK	
Columbia University, College of Physicians and Surgeons.....	1910
Cornell University Medical College.....	1908
Syracuse University, College of Medicine.....	1910
NORTH CAROLINA	
Leonard Medical School	1914
Wake Forest College School of Medicine.....	1908
NORTH DAKOTA	
University of North Dakota, School of Medicine	1907

OHIO

Western Reserve University School of Medicine.....	1901
Medical College of the University of Cincinnati.....	1913

PENNSYLVANIA

University of Pennsylvania, School of Medicine.....	1910
University of Pittsburgh, School of Medicine.....	1913

SOUTH DAKOTA

University of South Dakota, College of Medicine.....	1909
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UTAH

University of Utah, School of Medicine.....	1910
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WISCONSIN

University of Wisconsin Medical School	1907
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The fifty following colleges require, in addition to a four-year high-school course, one year of college work in physics, chemistry, biology and a modern language, the requirement beginning in the year given:

ALABAMA

In Force

University of Alabama, School of Medicine	1914
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CALIFORNIA

College of Physicians and Surgeons, Los Angeles.....	1914
College of Medical Evangelists	1914

DISTRICT OF COLUMBIA

George Washington University, Medical School.....	1914
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GEORGIA

Atlanta Medical College	1914
University of Georgia, Medical Department.....	1914

ILLINOIS

Bennett Medical College	1914
Chicago College of Medicine and Surgery.....	1914
Hahnemann Medical College and Hospital	1914
Jenner Medical College	1913

KENTUCKY

University of Louisville, Medical Department.....	1914
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LOUISIANA

Tulane University of Louisiana, School of Medicine.....	1910
---	------

MAINE

Medical School of Maine	1912
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MARYLAND

College of Physicians and Surgeons.....	1914
University of Maryland, School of Medicine	1914

MASSACHUSETTS

Boston University, School of Medicine	1914
Tufts College Medical School	1914

MICHIGAN

Detroit College of Medicine and Surgery	1914
University of Michigan, Homeopathic Medical College.....	1912

MISSISSIPPI

University of Mississippi, Department of Medicine	1914
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MISSOURI

St. Louis University, School of Medicine	1910
American Medical College	1914

NEBRASKA

John A. Creighton Medical College	1914
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NEW YORK

Albany Medical College	1914
Fordham University, School of Medicine	1911
Long Island College Hospital	1914
University and Bellevue Hospital Medical College.....	1912
University of Buffalo, Medical Department	1914

NORTH CAROLINA

University of North Carolina, School of Medicine	1910
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OHIO

Ohio State University, College of Medicine.....	1914
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OKLAHOMA

University of Oklahoma, School of Medicine.....	1914
---	------

OREGON

University of Oregon, Department of Medicine	1910
--	------

PENNSYLVANIA

Hahnemann Medical College and Hospital.....	1913
Jefferson Medical College	1913
Medico-Chirurgical College of Philadelphia	1913
Temple University, Department of Medicine	1913
Woman's Medical College of Pennsylvania	1913

SOUTH CAROLINA

Medical College of the State of South Carolina	1914
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TENNESSEE

Vanderbilt University, Medical Department.....	1914
University of Tennessee, College of Medicine	1914
University of West Tennessee, College of Medicine and Surgery..	1914

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TABLE I.—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA

Marginal Number.	NAME AND LOCATION OF COLLEGE	Population of city where college is located (Census of 1910)	Classification by Council on Medical Education	No. of students registered 1913-14		Grads. with A.B. 1911		U.S. or Ph.D.	No. of teachers	Weeks in college year	Total Fees (Dollars).				Executive Officer	Session of 1914-15		Marginal Number.
				Men.	Women.	Men.	Women.				1st year.	2d year.	3d year.	4th year.		Begins 1914	Ends 1915	
1	ALABAMA																	1
2	Birmingham Medical College, Birmingham (a).....	132,685	B	151	...	51	...	5	32	32	160	155	150	120	E. P. Hogan, M.D. Secretary.....	Oct. 1	May 28	2
3	University of Alabama, School of Medicine, Mobile.....	51,521	A	91	...	21	...	4	55	32	160	155	150	175	Eugene B. Bondurant, M.D., Dean.....	Sept. 21	June 9	3
4	ARKANSAS																	4
5	University of Arkansas, Medical Department, Little Rock.....	45,911	B	94	1	34	...	1	51	32	125	125	125	150	Morgan Smith, M.D., Dean.....	Sept. 11	May 13	5
6	CALIFORNIA																	6
7	College of Physicians and Surgeons, San Francisco.....	416,912	C	469	85	78	14	29	24	25	165	160	160	185	C. O. Southard, M.D., Secretary.....	Sept. 2	June 4	7
8	Hahnemann Medical College of the Pacific, San Francisco.—H.....	416,912	B	31	3	7	1	2	38	31	125	120	120	160	James W. Ward, M.D., Dean.....	Aug. 11	April 29	8
9	Leland Stanford Junior Univ., School of Med., San Francisco.....	416,912	A+	60	15	9	...	...	33	31	160	155	150	170	Ray Lyman Wilbur, M.D., Dean.....	Sept. 2	May 17	9
10	University of California, College of Medicine, San Francisco.....	416,912	A+	98	26	10	3	10	76	30	195	190	185	165	Herbert C. Moffit, M.D., Dean.....	Aug. 7	May 8	10
11	California Eclectic Medical College, Los Angeles.—E.....	319,198	C	29	9	9	2	2	20	32	115	110	100	125	...	...	...	11
12	College of Physicians and Surgeons, Los Angeles.....	319,198	B	143	10	23	2	4	78	33	172	172	172	175	Charles W. Bryson, M.D., Dean.....	Sept. 9	June 10	12
13	College of Physicians and Surgeons, Oakland.....	150,174	B	12	3	2	1	2	41	38	210	200	175	175	Edward N. Ever, M.D., Registrar.....	Aug. 18	May 22	13
14	Oakland College of Medicine and Surgery, Oakland.....	110	C	50	19	1	2	2	23	35	111	136	136	136	Alfred Shryock, M.D., Dean.....	Sept. 13	June 8	14
15	COLORADO																	15
16	University of Colorado, School of Medicine, Boulder-Denver.....	213,331	A	53	1	16	1	9	73	35	75	75	75	75	William P. Harlow, M.D., Dean.....	Sept. 14	June 9	16
17	CONNECTICUT																	17
18	Yale Medical School, New Haven.....	133,005	A+	49	...	8	...	8	66	35	223	170	163	163	George Blumer, M.D., Dean.....	Oct. 1	June 23	18
19	DISTRICT OF COLUMBIA																	19
20	George Washington University Medical School, Washington.....	331,009	A	377	3	68	1	8	73	33	150	150	150	150	W. C. Borden, M.D., Dean.....	Sept. 30	June 9	20
21	Georgetown University, School of Medicine, Washington.....	331,009	A	99	...	21	...	...	87	31	165	150	150	150	George M. Kober, M.D., Dean.....	Sept. 25	June 13	21
22	Howard University, School of Medicine, Washington.....	331,009	A	108	2	31	1	8	39	32	167	162	162	169	Edward A. Bulloch, M.D., Dean.....	Oct. 1	June 2	22
23	GEORGIA																	23
24	Atlanta Medical College.....	154,839	A	846	...	185	...	7	112	32	150	150	150	150	W. S. Elkin, M.D., Dean.....	Sept. 28	June 1	24
25	Georgia College of Eclectic Medicine and Surgery, Atlanta.—E (e).....	154,839	C	458	...	125	...	4	...	...	...	...	...	...	...	...	...	25
26	Southern College of Medicine and Surgery, Atlanta (d).....	154,839	C	51	...	21	...	...	...	...	...	...	...	...	...	...	...	26
27	University of Georgia, Medical Department, Augusta (e).....	41,040	A	53	...	20	...	3	47	31	150	150	150	150	W. H. Doughty, Jr., M.D., Dean.....	Sept. 16	June 1	27
28	ILLINOIS																	28
29	Bennett Medical College, Chicago.....	2,185,283	B	231	143	570	26	127	69	32	150	150	150	150	Maxmillian Herzog, M.D., Dean.....	Sept. 30	May 28	29
30	Chicago College of Medicine and Surgery, Chicago.....	2,185,283	B	305	11	110	1	4	114	32	150	150	150	150	William J. Butler, M.D., Dean.....	Sept. 29	May 24	30
31	Chicago Hospital College of Medicine, Chicago.....	2,185,283	O	597	41	165	1	...	65	32	110	107	100	105	Edwin Pynehon, M.D., Dean.....	Sept. 1	May 21	31
32	Hahnemann Medical College and Hospital, Chicago.—H.....	2,185,283	B	75	14	15	...	2	73	32	146	131	165	187	Joseph P. Cobb, M.D., Dean.....	Sept. 28	May 27	32
33	Jenner Medical College, Chicago.....	2,185,283	O	183	16	8	3	3	60	37	145	140	150	155	John D. MacKellar, M.D., Secretary.....	Sept. 7	May 13	33
34	Northwestern University Medical School, Chicago.....	2,185,283	A+	180	69	69	...	27	130	33	190	190	190	206	Arthur R. Edwards, M.D., Dean.....	Sept. 29	June 6	34
35	Rush Medical College (University of Chicago).....	2,185,283	A+	420	32	95	2	87	288	34	185	180	150	195	John M. Dodson, M.D., Dean.....	Oct. 1	June 19	35
36	University of Illinois, College of Medicine, Chicago.....	2,185,283	A	303	29	107	6	6	149	31	155	155	150	160	D. A. K. Steele, M.D., Dean.....	Oct. 1	June 11	36
37	INDIANA																	37
38	Indiana University, School of Medicine, Indianapolis.....	233,650	A+	123	5	20	2	10	130	35	100	100	100	130	Charles P. Emerson, M.D., Dean.....	Sept. 29	June 23	38
39	IOWA																	39
40	State University of Iowa, College of Medicine, Iowa City.....	10,091	A+	110	3	13	...	7	42	35	110	100	100	110	Lee Wallace Dean, M.D., Dean.....	Sept. 21	June 16	40
41	State Univ. of Iowa, Coll. of Homeopathic Medicine, Iowa City.—H.....	10,091	A	105	3	13	...	...	30	35	110	100	100	110	George Royal, M.D., Dean.....	Sept. 21	June 16	41
42	KANSAS																	42
43	University of Kansas, School of Medicine, Rosedale.....	5,060	A	102	3	9	1	9	53	35	30	25	100	105	Merwin T. Sadler, M.D., Asso. Dean.....	Sept. 16	June 10	43
44	KENTUCKY																	44
45	University of Louisville, Medical Department, Louisville.....	223,923	A	278	...	54	...	5	93	33	170	165	165	175	Henry Enos Tuley, M.D., Dean.....	Sept. 28	June 3	45
46	LOUISIANA																	46
47	Tulane University of Louisiana, School of Medicine.....	339,075	A+	327	...	77	...	21	115	33	165	195	195	225	Isadore Dyer, M.D., Dean.....	Sept. 28	June 2	47
48	MAINE																	48
49	Medical School of Maine, Portland.....	58,571	A	67	...	19	...	9	66	33	110	110	110	135	Addison S. Thayer, M.D., Dean.....	Oct. 15	June 24	49
50	MARYLAND																	50
51	College of Physicians and Surgeons, Baltimore.....	558,485	A	974	24	235	11	90	69	32	165	165	165	165	William F. Lockwood, M.D., Dean.....	Oct. 1	June 1	51
52	Johns Hopkins University, Medical Department, Baltimore.....	558,485	A+	184	...	58	...	11	127	32	240	200	200	200	J. Whitridge Williams, M.D., Dean.....	Oct. 6	June 8	52
53	University of Maryland, School of Medicine, Baltimore.....	558,485	A	336	24	80	...	91	139	32	170	170	170	200	R. Dorsey Conle, M.D., Dean.....	Oct. 1	June 1	53

39	MASSACHUSETTS	Boston University, School of Medicine.—H.....	670,585	A	783	56	152	9	70	68	32	162	147	127	155	John P. Sutherland, M.D., Dean.....	Oct. 1	June 2	39
40		College of Physicians and Surgeons, Boston (f).....	670,585	C	110	24	18	4	4	58	35	80	100	100	130	Thomas D. O'Brother, M.D., Dean.....	Sept. 16	June 9	40
41		Medical School of Harvard University, Boston.....	670,585	A+	305	279	61	...	64	207	36	237	208	200	200	Edward H. Bradford, M.D., Dean.....	Sept. 28	June 24	41
42		Tufts College Medical School, Boston.....	670,585	A	279	32	57	5	2	122	32	155	135	135	135	Charles F. Painter, M.D., Dean.....	Sept. 30	May 30	42
43	MICHIGAN	Detroit College of Medicine and Surgery, Detroit.....	465,766	A	573	26	110	2	32	169	33	135	130	110	130	Frank B. Walker, M.D., Secretary.....	Sept. 21	June 3	43
44		University of Michigan, Dept. of Med and Surg., Ann Arbor (g).....	14,817	A+	219	22	35	1	31	75	35	138	102	117	77	Victor C. Vaughan, M.D., Dean.....	Sept. 23	June 24	44
45		University of Michigan, Homeopathic College, Ann Arbor.—H (g).....	14,817	A	69	1	21	...	...	18	35	138	102	117	77	W. B. Hinsdale, M.D., Dean.....	Sept. 23	June 24	45
46	MINNESOTA	University of Minnesota, Medical School, Minneapolis.....	301,408	A+	162	7	28	2	26	81	35	150	150	150	150	E. P. Lyon, M.D., Dean.....	Sept. 16	June 11	46
47	MISSISSIPPI	University of Mississippi, Department of Medicine, Oxford (h).....	2,014	A	35	...	...	...	...	14	31	101	101	...	...	Walter S. Leathers, M.D., Dean.....	Sept. 17	June 1	47
48	MISSOURI	University of Missouri, School of Medicine, Columbia (h).....	9,662	A+	615	20	150	7	30	15	34	125	125	40	...	Guy L. Noyes, M.D., Acting Dean.....	Sept. 14	June 3	48
49		Kansas City Hahnemann Medical College, Kansas City.—H.....	248,381	C	52	3	12	1	...	40	34	125	125	125	125	M. T. Runnels, M.D., Dean.....	Sept. 8	May 20	49
50		Eclectic Medical University, Kansas City.—E.....	248,381	C	50	6	12	2	...	20	30	100	100	100	100	...	...	50	
51		Ensworth Medical College, St. Joseph (f).....	77,403	C	10	...	0	...	...	...	...	...	...	...	...	...	...	51	
52		American Medical College, St. Louis.....	687,039	C	141	5	31	3	1	93	34	140	135	135	135	James Moores Ball, M.D., Dean.....	Sept. 22	June 7	52
53		St. Louis University, School of Medicine, St. Louis.....	687,039	C	204	48	31	3	19	122	32	140	140	140	140	H. W. Lobb, M.D., Dean.....	Sept. 15	May 17	53
54		St. Louis College of Physicians and Surgeons, St. Louis (j).....	687,039	C	41	4	23	1	...	...	...	...	...	...	...	...	...	54	
55		Washington University Medical School, St. Louis.....	687,039	A+	61	15	15	1	10	79	34	155	150	150	155	E. L. Opie, M.D., Dean.....	Sept. 21	June 10	55
56	NEBRASKA	John A. Creighton Medical College, Omaha.....	124,006	B	281	14	49	2	11	53	32	130	120	120	120	A. L. Muirhead, M.D., Dean.....	Sept. 1	April 30	56
57		University of Nebraska, College of Medicine, Omaha.....	124,006	A+	150	2	35	1	4	60	34	125	120	110	110	Irving S. Cutler, M.D., Secretary.....	Sept. 14	June 4	57
58		Cotner University Medical College, Lincoln.—E.....	43,973	C	24	5	4	1	2	33	33	100	100	100	100	R. L. Hof, Registrar.....	Sept. 14	May 27	58
59	NEW HAMPSHIRE	Dartmouth Medical School, Hanover (h).....	2,075	A	23	...	6	...	5	26	36	173	170	...	...	John M. Gile, M.D., Dean.....	Sept. 24	June 23	59
60	NEW YORK	Albany Medical College, Albany.....	100,253	A	2077	76	432	15	97	103	32	135	140	120	130	Joseph D. Craig, M.D., Registrar.....	Sept. 22	May 25	60
61		Columbia University, College of Phys. and Surg., New York.....	4,766,883	A+	238	...	52	...	4	209	33	255	250	250	275	Samuel W. Lambert, M.D., Dean.....	Sept. 23	June 10	61
62		Cornell University Medical College, New York City.....	4,766,883	A+	308	...	71	5	51	137	33	200	185	185	200	Wm. M. Polk, M.D., Dean.....	Sept. 30	June 2	62
63		Fordham University, School of Medicine, New York City.....	4,766,883	A	175	...	29	...	3	99	33	200	200	200	200	William P. Healy, M.D., Dean.....	Sept. 25	June 8	63
64		Long Island College Hospital, New York City.....	4,766,883	A	300	...	70	...	4	113	33	210	205	200	200	Joseph H. Raymond, M.D., Secretary.....	Sept. 22	June 7	64
65		New York Homeopathic Medical College and Flower Hospital.—H.....	4,766,883	A	237	...	43	...	...	85	33	165	160	150	150	Royal S. Copeland, M.D., Dean.....	Sept. 23	May 26	65
66		New York Medical College and Hospital for Women.—H.....	4,766,883	O	237	...	42	...	7	...	...	...	...	...	...	Cornelia C. Brant, M.D., Dean.....	Sept. 23	June 3	66
67		University and Bellevue Hospital Medical College, New York.....	4,766,883	A	333	...	42	...	...	...	...	...	...	...	...	Samuel A. Brown, M.D., Secretary.....	Sept. 23	June 9	67
68		Syracuse University, College of Medicine, Syracuse.....	137,219	A+	32	4	15	1	9	73	33	192	187	187	207	John L. Hefron, M.D., Dean.....	Sept. 23	June 9	68
69		University of Buffalo, Medical Department, Buffalo.....	423,715	A	221	15	45	2	...	100	33	185	140	140	140	Herbert U. Williams, M.D., Dean.....	Sept. 21	June 4	69
70	NORTH CAROLINA	Leonard Medical School, Raleigh (h).....	10,218	B	252	3	36	...	5	22	30	50	50	50	50	George H. Stoddard, M.D., Dean.....	Sept. 30	May 13	70
71		University of North Carolina, School of Med., Chapel Hill (h).....	1,149	A	60	...	8	...	2	25	35	120	125	...	...	Isaac Hall Manning, M.D., Dean.....	Sept. 7	June 2	71
72		North Carolina Medical College, Charlotte (k).....	31,014	C	28	3	23	...	...	10	35	103	...	...	...	E. B. Earnshaw, M.D., Secretary.....	Sept. 1	May 21	72
73		Wake Forest College School of Medicine, Wake Forest (h).....	1,443	A	28	...	...	...	...	...	...	...	...	...	...	...	...	73	
74	NORTH DAKOTA	Univ. of No. Dakota, School of Med., University (Grand Forks) (h).....	12,478	A	13	1	...	...	...	17	35	50	50	...	...	H. E. French, M.D., Dean.....	Sept. 22	June 16	74
75	OHIO	Cleveland College of Physicians and Surgeons, Cleveland.....	500,063	A	647	13	130	4	44	...	...	...	...	...	...	...	...	75	
76		Cleveland-Pulte Medical College, Cleveland.—H (f).....	500,063	C	4	...	4	...	...	...	...	...	...	...	...	...	...	76	
77		Western Reserve University, School of Medicine, Cleveland.....	500,063	A+	53	...	11	...	...	...	...	...	...	...	...	F. C. Waite, Ph.D., Registrar.....	Oct. 1	June 7	77
78		Eclectic Medical College, Cincinnati.—E.....	333,591	B	82	5	18	1	30	60	33	162	153	150	155	John K. Seutter, M.D., Secretary.....	Sept. 10	May 10	78
79		Medical College of the University of Cincinnati.....	333,591	A+	55	5	12	2	7	137	34	155	150	150	175	Christian R. Holmes, M.D., Dean.....	Sept. 20	June 12	79
80		Ohio State University, College of Medicine, Columbus (m).....	181,511	A	281	3	53	1	2	76	34	150	150	135	135	William J. Means, M.D., Dean.....	Sept. 16	June 1	80
81		Toledo Medical College, Toledo (n).....	169,497	C	19	...	2	...	...	...	...	...	...	...	...	...	...	81	
82	OKLAHOMA	Univ. of Oklahoma, School of Med., Norman and Oklahoma City.....	64,205	B	94	...	14	...	...	56	34	37	24	10	10	Curtis R. Day, M.D., Dean, Oklahoma City.....	Sept. 22	June 10	82
83	OREGON	University of Oregon, Department of Medicine, Portland.....	207,214	A	77	2	25	1	3	62	32	150	150	150	150	Kenneth A. J. Mackenzie, M.D., Dean.....	Oct. 1	June 1	83
84	PENNSYLVANIA	Hahnemann Medical College and Hospital, Philadelphia.—H.....	1,549,008	A	1570	105	373	19	79	89	33	195	190	160	160	William A. Pearson, M.D., Dean.....	Sept. 21	June 3	84
85		Jefferson Medical College, Philadelphia.....	1,549,008	A+	648	...	147	...	17	157	33	200	200	200	200	Ross V. Patterson, M.D., Sub-Dean.....	Sept. 21	June 5	85
86		Medico-Chirurgical College of Philadelphia.....	1,549,008	A	350	...	75	...	114	33	162	150	155	153	153	Seneca Egbert, M.D., Dean.....	Sept. 21	June 4	86
87		Temple University, Department of Medicine, Philadelphia.....	1,549,008	A	90	11	17	1	...	97	34	150	150	210	210	Frank G. Hammond, M.D., Dean.....	Sept. 17	June 5	87
88		University of Pennsylvania, School of Medicine, Philadelphia (o).....	1,549,008	B	266	...	74	...	50	174	35	230	212	210	213	William Pepper, M.D., Dean.....	Sept. 25	June 16	88
89		Woman's Medical College of Pennsylvania, Philadelphia.....	1,549,008	A	123	...	46	...	5	61	34	187	181	178	180	Clara Marshall, M.D., Dean.....	Sept. 16	June 2	89
90		University of Pittsburgh, School of Medicine, Pittsburgh.....	583,905	A+	104	...	19	...	6	62	32	140	140	140	140	Thomas S. Arbutnot, M.D., Dean.....	Sept. 23	June 10	90
91	SOUTH CAROLINA	Medical College of the State of South Carolina, Charleston.....	58,833	B	104	...	19	...	...	...	...	...	...	...	...	Robert Wilson, Jr., M.D., Dean.....	Oct. 1	June 3	91

TABLE 1.—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA—(Concluded)

Marginal Number.	NAME AND LOCATION OF COLLEGE	Population of city where college is located. (Census of 1910)	Classification by Council on Medical Education.	No. of students registered 1913-14		Grads. with A.B., B.S. or Ph.B.	No. of teachers.	Weeks in college	Total Fees (Dollars).				Executive Officer	Session of 1914-15		Marginal Number.
				Men.	Women.				1st year.	2d year.	3d year.	4th year.		Begins 1914	Ends 1915	
92	SOUTH DAKOTA University of South Dakota, College of Medicine, Vermillion (h)...	2,157	A	14	11	...	9	35	60	60	...	...	Christian P. Lommen, Dean.....	Sept. 15	June 10	92
93	TENNESSEE Lincoln Memorial University, Medical Department, Knoxville (p)...	35,316	C	1197	12	258	1	...	...	...	...	...	George W. Hubbard, M.D., Dean.....	Sept. 9	April 20	93
94	McHenry Medical College, Nashville.....	110,264	B	323	6	72	1	28	70	70	70	80	Lachus O. Burch, M.D., Acting Dean.....	Sept. 16	June 16	94
95	Vanderbilt University, Medical Department, Nashville.....	110,364	A+	281	...	65	...	36	150	150	150	150	Herbert T. Brooks, M.D., Dean.....	Sept. 22	June 4	95
96	University of Tennessee, College of Medicine, Memphis.....	131,105	A	310	5	77	...	4	103	125	125	125	M. V. Lynk, M.D., Dean.....	Sept. 14	May 1	96
97	University of West Tennessee, Coll. of Med. and Surg., Memphis..	131,105	O	73	...	25	...	21	55	55	55	65	...	Sept. 14	May 1	97
98	TEXAS Texas Christian University, School of Medicine, Fort Worth.....	73,312	B	308	15	66	3	33	111	113	108	125	I. C. Chase, M.D., Dean.....	Sept. 8	June 4	98
99	University of Texas, Department of Medicine, Galveston.....	36,981	A+	160	12	20	3	29	75	75	75	75	W. S. Carter, M.D., Dean.....	Oct. 1	May 31	99
100	Baylor University, College of Medicine, Dallas.....	92,101	B	45	2	18	...	46	125	115	115	135	E. H. Cary, M.D., Dean.....	Sept. 30	May 31	100
101	Southern Methodist University, Medical Department, Dallas.....	92,101	B	50	1	17	...	38	113	108	103	125	John O. McReynolds, M.D., Dean.....	Sept. 30	June 3	101
102	UTAH University of Utah, School of Medicine, Salt Lake City (h).....	92,777	A	19	1	...	...	19	61	61	...	...	J. T. Kingsbury, President.....	Sept. 14	June 3	102
103	VERMONT University of Vermont, College of Medicine, Burlington.....	20,468	A	117	...	39	...	2	115	115	145	170	H. C. Tinkham, M.D., Dean.....	Sept. 23	June 23	103
104	VIRGINIA Medical College of Virginia, Richmond.....	127,028	A	490	...	105	...	17	161	111	111	141	Stuart McGuire, M.D., Dean.....	Sept. 15	June 1	104
105	University of Virginia, Department of Med., Charlottesville.....	6,765	A+	101	...	17	...	7	130	140	140	110	R. H. Whitehead, M.D., Dean.....	Sept. 14	June 16	105
106	WEST VIRGINIA West Virginia University, School of Medicine, Morgantown (h)....	9,120	B	18	3	...	...	11	60	40	...	...	John N. Simpson, M.D., Dean.....	Sept. 14	June 16	106
107	WISCONSIN Marquette University School of Medicine, Milwaukee.....	373,557	B	243	9	43	...	4	150	175	175	175	Louis F. Jermahn, M.D., Dean.....	Oct. 1	June 17	107
108	University of Wisconsin Medical School, Madison (h).....	25,631	A+	76	7	43	...	25	170	170	...	...	Charles R. Bardeen, M.D., Dean.....	Sept. 23	June 18	108
109	PHILIPPINE ISLANDS Univ. of the Philippines, College of Med. and Surg., Manila (g)....	234,409	...	80	12	7	2	3	...	...	...	...	William E. Musgrave, M.D., Dean.....	July 1	Mar. 30	109
110	CANADA University of Alberta, Medical Faculty, Edmonton, Alta. (r).....	24,900	...	1759	33	320	1	25	50	75	...	...	Cecil E. Race, B.A., Registrar.....	Sept. 30	May 12	110
111	Dalhousie University, Faculty of Medicine, Halifax, N. S. (s).....	46,019	...	26	...	14	...	...	100	100	100	100	A. W. H. Lindsay, M.D., Secretary.....	Sept. 9	May 6	111
112	Queen's University, Faculty of Medicine, Kingston, Ont. (s).....	18,874	...	70	5	...	...	...	105	105	105	135	J. C. Connell, M.D., Dean.....	Sept. 14	April 28	112
113	Western University, Medical Faculty, London, Ont. (s).....	46,300	...	268	...	50	...	...	110	110	110	110	H. A. McCallum, M.D., Dean.....	Oct. 1	June 5	113
114	McGill University, Faculty of Medicine, Montreal, Que. (s).....	470,480	...	382	...	63	...	12	120	164	164	191	John W. Seane, M.D., Registrar.....	Oct. 1	June 8	114
115	Montreal School of Medicine and Surgery, Montreal, Que. (s).....	470,480	...	121	...	22	...	60	110	118	126	138	E. P. Lachapelle, M.D., Registrar.....	Oct. 1	June 19	115
116	Laval University, Medical Faculty, Quebec, Que. (s).....	78,190	...	88	...	14	...	24	60	60	60	60	Michael J. Ahern, M.D., Dean.....	Sept. 29	May 29	116
117	University of Toronto, Faculty of Medicine, Toronto, Ont. (s).....	376,538	...	530	24	85	...	183	150	150	150	150	A. Primrose, M.D., Secretary.....	Sept. 29	May 29	117
118	University of Manitoba, Manitoba Medical College, Winnipeg (s)....	136,036	...	181	4	45	...	33	155	150	150	150	H. H. Chow, M.D., Dean.....	Sept. 21	May 1	118

* From the Third Classification of Medical Colleges, revised to June 21, 1914. See page 669.

REFERENCES

- After the one remaining class has been graduated, this college will discontinue undergraduate medical teaching.
- Gives a five-year course, including a number of theoretical, non-medical, subjects.
- It is rumored that this college has been suspended.
- Reported closed following withdrawal of recognition by the Georgia State Board of Medical Examiners.
- No tuition fees charged by this college for students who are bona fide residents of Georgia.
- Catalogue contains names of 238 "matriculants and applicants," including dental students. The number of medical students actually in attendance is approximately as given.
- Fees given are for non-residents; they are \$10 less each year for residents of Michigan.

(h) These colleges give only the work of the first two years of the medical course.

(i) This college has been closed.

(j) No information obtained as to whether this college will reopen or not.

(k) This college has been merged with the Medical College of Virginia at Richmond.

(l) Reported to have transferred its property to the Ohio State University.

(m) This college was formerly the Starling-Ohio Medical College.

(n) Reported closed following withdrawal of recognition by the Ohio State Medical Board.

(o) This medical school will admit women students hereafter.

(p) This college has merged with the University of Tennessee College of Medicine at Memphis.

(q) This medical school is controlled and financed by the government. No tuition fees are charged.

(r) Gives only the work of the first two years of the Canadian five-year course, which corresponds to the preliminary college science year, and the first medical year in the United States.

(s) All these colleges give a five-year course, which includes a year of preliminary science work. This is the equivalent of the course given by the fifty medical schools in the United States which require one year of college preliminary science work for entrance. The course is surpassed by thirty-four medical colleges in the United States which require two years of collegiate work for admission.

CONTINUED FROM PAGE 671

TEXAS

Texas Christian University, School of Medicine	1914
University of Texas, Department of Medicine	1910
Baylor University, College of Medicine	1913
Southern Methodist University, Medical Department.....	1914

VERMONT

University of Vermont, College of Medicine.....	1912
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VIRGINIA

Medical College of Virginia	1914
University of Virginia, Department of Medicine.....	1910

WEST VIRGINIA

West Virginia University, School of Medicine	1911
--	------

WISCONSIN

Marquette University, School of Medicine	1914
--	------

The five following medical colleges shown in the above list as now requiring one year of collegiate work for admission have announced that all students admitted in the session of 1915-16 and thereafter will be required to have completed two years of such collegiate work.

University of Alabama, School of Medicine.
Ohio State University, College of Medicine.
Woman's Medical College of Pennsylvania.
Medical College of Virginia.
Marquette University, School of Medicine.

The Medical Department of the University of Arkansas and the Hahnemann Medical College of the Pacific announce that all students admitted in 1915-16 will be required to present at least one year of collegiate work or enter on a five-year course including a preliminary year of college physics, chemistry and biology.

Hospital Intern Year

Three medical colleges have adopted the requirement of a fifth year to be spent by the student as an intern in an approved hospital or in other acceptable clinical work before the M.D. degree will be granted. These colleges and the sessions when the requirement became effective are as follows:

University of Minnesota, Medical School.....	1910-11
Leland Stanford Jr. University, School of Medicine.....	1914-15
Rush Medical College.....	1914-15

One state licensing board, that of Pennsylvania, now requires that every candidate to be eligible for license to practice medicine in that state, must have served at least one year as an intern in an approved hospital. The requirement became effective in 1914.

Graduate Courses in Public Health

Graduate courses in public health have been established in connection with seven medical schools leading to a degree of Doctor of Public Health (Dr.P.H.), Certified Sanitarian (C.S.), Master of Science in Public Health (M.S.(P.H.)) or Master of Public Health (M.P.H.). The course is for one year except at the Universities of Michigan, Minnesota and Wisconsin where the course for the Doctorate covers two years. Wisconsin gives a Diploma in Public Health (D.P.H.) for a one-year course. These colleges are as follows:

MEDICAL COLLEGES GIVING COURSES IN PUBLIC HEALTH

Name of College	Course started in	Degree granted	Years in Course	Degrees required for entrance	Fees
Univ. of Penn. Sch. of Med.	1909	{Dr.P.H....	1	M.D.	\$150
Med. Sch. of Harvard Univ.	1910	{C.S....	1	A.B. or B.S.	150
Univ. of Mich. Dept. M. & S.	1912	{Dr.P.H....	1	A.B. or B.S.	87*
		{M.S.(P.H.)	1	{ and M.D.	183*
Univ. of Wis. Med. School..	1912	{Dr.P.H....	1	M.D.	104†
		{D.P.H....	1	M.D.	183†
Detroit College of M. & S..	1913	{M.P.H....	1	M.D.	60
Univ. & Bell. Hosp. M. O.	1914	{Dr.P.H....	1	M.D.	200
Tulane Univ., Sch. of Med..	1914	{Dr.P.H....	1	M.D.	†
Univ. of Minn. Med. School.	1914	{Dr.P.H....	2	M.D.	†

* For residents of Michigan the fees for the one- and the two-year courses, respectively are \$62 and \$104. † For residents of Wisconsin the fees are \$70 less each year. ‡ Information not obtained.

State University Medical Schools

Twenty-eight states now have medical schools as integral parts of the state universities or—in one instance—under state control as separate institutions. These states and other interesting data regarding the medical schools are as follows:

STATE UNIVERSITY MEDICAL SCHOOLS

Medical School of State University of	Only School in State	Length of Med. Course in Years.	Years of College Work for Admission.	Medical School of State University of	Only School in State	Length of Med. Course in Years.	Years of College Work for Admission.
Alabama.....	1915	4	1 ²	North Carolina.....	.....	2	1
Arkansas.....	Yes	4	1 ²	North Dakota.....	Yes	2	2 ³
California.....	.....	4	2	Ohio.....	.....	4	1 ²
Colorado.....	Yes	4	2 ³	Oklahoma.....	Yes	4	1
Georgia.....	.....	4	1	Oregon.....	Yes	4	1
Illinois.....	.....	4	2	South Carolina.....	Yes	4	1
Indiana.....	Yes	4	2 ³	South Dakota.....	Yes	2	2 ³
Iowa.....	Yes	4	2 ³	Tennessee.....	.....	4	1
Kansas.....	Yes	4	2	Texas.....	.....	4	1
Michigan.....	.....	4	2	Utah.....	Yes	2	2
Minnesota.....	Yes	5	2 ³	Vermont.....	Yes	4	1
Mississippi.....	Yes	2	1	Virginia.....	.....	4	1
Missouri.....	.....	2	2	West Virginia.....	Yes	2	1
Nebraska.....	.....	4	2	Wisconsin.....	.....	2	2

* Have Homeopathic Departments.

1. To require 1 year in 1915

2. To require 2 years in 1915.

3. Similar requirements by Licensing Board.

In fifteen states no other medical schools exist, medical education in the state being entirely in charge of the state university. This will be true in Alabama also in 1915, when an independent medical school now existing will give only post-graduate instruction.

Of the twenty-eight state medical schools, twenty give the complete medical course and grant M.D. degrees while eight give only the first two years of the medical course. Minnesota requires a five-year course, the fifth year to be spent by the student in a hospital as an intern, or in other recognized clinical work. The universities of Iowa and Michigan have Homeopathic departments and one is contemplated also in Ohio. In Iowa the entrance requirements are the same for the two departments, but in Michigan, while for the regular department two years of collegiate work are required for entrance, only one year is required for the Homeopathic College; nevertheless, the students of the two colleges are taught together in the work of the first two years.

As may be noted, fourteen of these state university medical schools are now requiring for admission two years of collegiate work. The medical schools of the University of Alabama and the Ohio State University have announced the two-year requirement to take effect in 1915. As already shown the state schools are supported in this requirement by the state licensing boards in Colorado, Indiana, Iowa, Minnesota, North Dakota and South Dakota. This will be true also in Alabama in 1915. Of the twelve remaining state university medical schools all but the University of Arkansas are now requiring for admission a standard four-year high-school course and in addition one year of collegiate work. The one year requirement becomes effective in Arkansas also in 1915 both for the Medical School and the State Licensing Board.

The Combined Course in Liberal Arts and Medicine

There are fifty-six medical schools which announce that arrangements have been made whereby students can secure degrees in both arts and medicine in six or seven years' time. Many have arranged for the B.S. and M.D. degrees in six years, or the A.B. and M.D. degrees in seven years. Nine of these colleges give only the first two years of the medical course and, therefore, offer only the first four or five years of the combined course. These are indicated by the figures four and five in parentheses. The list of medical schools follows:

CONTINUED ON PAGE 678

TABLE 2.—DISTRIBUTION OF MEDICAL

Marginal Number.	NAME OF COLLEGE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Marginal Number.
		Alabama.....350	Arizona.....16	Arkansas.....177	California.....395	Colorado.....87	Connecticut.....189	Delaware.....22	Dist. of Col.....101	Florida.....127	Georgia.....598	Idaho.....86	Illinois.....1,258	Indiana.....350	Iowa.....322	Kansas.....241	Kentucky.....200	Louisiana.....212	Maine.....114	Maryland.....232	Massachusetts.....701	
1	Birmingham Medical College, Birmingham.....	55																				1
2	University of Alabama, School of Med., Mobile.....	52																				2
3	University of Arkansas, Medical Dept., Little Rock.....	1																				3
4	College of Phys. and Surgs., San Francisco.....			80	1																	4
5	Hahnemann Medical College of the Pacific.—H*.....			1	11																	5
6	Leland Stanford Junior Univ., School of Medicine.....				40																	6
7	Univ. of California, Coll. of Med., San Francisco.....				60	1																7
8	California Eclectic Med. Coll., Los Angeles.—E.....				114																	8
9	College of Physicians and Surgeons, Los Angeles.....				35																	9
10	Oakland College of Med. and Surg., Oakland.....		1	1	20	3	1		1													10
11	College of Medical Evangelists, Loma Linda.....				14																	11
12	Univ. of Colorado, School of Med., Boulder-Denver.....				18	1			1	1												12
13	Yale Medical School, New Haven.....		1	1		37																13
14	George Washington University, Med. School.....				2																	14
15	Georgetown University, School of Medicine.....				1	4			46	1	1											15
16	Howard University, School of Med., Washington.....				1	7			22													16
17	Atlanta Medical College.....								14	4	4											17
18	Georgia College of Eclectic Med. and Surg.—E.....				1																	18
19	Southern College of Med. and Surg., Augusta.....																					19
20	University of Georgia, Med. Dept., Augusta.....																					20
21	Bennett Medical College, Chicago.....			1	2		3			3	50											21
22	Chicago College of Medicine and Surgery, Chicago.....	11	2	3	4	2	2	1	1	3	1	1	1	1	1	1	1	1	1	1	1	22
23	Chicago Hospital College of Med., Chicago.....																					23
24	Hahnemann Med. Coll. and Hosp., Chicago.—H.....					1						1	37	9	8	3						24
25	Jenner Medical College, Chicago.....					1							58	8	6	4	3					25
26	Northwestern University Medical School, Chicago.....					3							72	3	13	6						26
27	Rush Medical College (University of Chicago).....					7							174	15	36	11	3	1	1	1	1	27
28	University of Illinois, College of Medicine, Chicago.....					4							207	16	18	12						28
29	Indiana University, School of Med., Indianapolis.....																					29
30	State Univ. of Iowa, College of Med., Iowa City.....																					30
31	State Univ. of Iowa, College of Homeo. Med.—H.....																					31
32	Univ. of Kansas, School of Med., Kansas City.....																					32
33	University of Louisville, Med. Dept., Louisville.....																					33
34	Tulane University of Louisiana, School of Medicine.....	31		11	1	1				11	8		1	1	1	1	3	130				34
35	Medical School of Maine, Portland.....																					35
36	College of Physicians and Surgeons, Baltimore.....					9																36
37	Johns Hopkins University, Med. Dept., Baltimore.....	13			11		5	2	2	1	16		10	6	6	4	7	3		59	14	37
38	University of Maryland, School of Medicine.....	2	1	1	2		13	1	2	6	4		1						1	127	21	38
39	Boston University, School of Medicine.—H.....				1		1															39
40	College of Physicians and Surgeons, Boston.....																					40
41	Medical School of Harvard University, Boston.....	1			12	9	6	1	1		3		7	3	5	2	1	1	13	3	123	41
42	Tufts College Medical School, Boston.....		1				11				2								11		242	42
43	Detroit College of Medicine and Surg., Detroit.....												2	9								43
44	Univ. of Michigan, Dept. of Med. and Surg.....	1			3		1		1		8		8	8	3	3	3				3	44
45	Univ. of Michigan, Homeo. Medical College.—H.....												3	3	3	2	1					45
46	University of Minnesota, Medical School.....											2	2	1	5	1						46
47	University of Mississippi, Dept. of Med., Oxford.....																					47
48	University of Missouri, School of Med., Columbia.....																					48
49	Kansas City Hahnemann Medical College.—H.....																					49
50	Eclectic Medical University, Kansas City.....			5																		50
51	Ensforth Medical College, St. Joseph.....												1									51
52	American Medical College, St. Louis.....	1		1	1							2	36	1								52
53	St. Louis University, School of Medicine.....			1	1	1	2					1	41	11	8	8	1	1	1			53
54	St. Louis College of Physicians and Surgeons*.....																					54
55	Washington University Medical School, St. Louis.....			1								1	9		2	1						55
56	John A. Creighton Medical College, Omaha.....		1			1							3		25	6						56
57	University of Nebraska, College of Med., Omaha.....			1													1					57
58	Cotner University Medical College.—E.....																					58
59	Dartmouth Medical School, Hanover.....					2													2		10	59
60	Albany Medical College, Albany.....																					60
61	Columbia University, Coll. of Phys. and Surgs.....	2		1	2	3	10		1		7	1	2	1	2	1						61
62	Cornell Univ. Medical College, New York City.....						6		1			1		1	1							62
63	Fordham Univ., School of Med., New York City.....						10	1		1												63
64	Long Island College Hospital, New York City.....						3															64
65	New York Homeo. Med. Coll. and Flower Hosp.—H.....				2		4				1		2									65
66	New York Med. Coll. and Hosp. for Women.—H.....				1																	66
67	Univ. and Bellevue Hosp. Med. Coll., New York.....						10		1				1									67
68	Syracuse University, Coll. of Med., Syracuse.....						1						1									68
69	University of Buffalo, Medical Dept., Buffalo.....																					69
70	Leonard Medical School, Raleigh.....	1								6	5											70
71	Univ. of No. Carolina, School of Med., Chapel Hill.....																					71
72	North Carolina Medical College, Charlotte.....																					72
73	Wake Forest College School of Med., Wake Forest.....																					73
74	University of North Dakota, School of Med.....																					74
75	Cleveland-Pulte Medical College, Cleveland.—H.....				1								3	2	3	2	1					75
76	Western Reserve University, School of Medicine.....				1								1	3		4						76
77	Eclectic Medical College, Cincinnati.—E.....												1	1								77
78	Medical College of the University of Cincinnati.....													2								78
79	Ohio State Univ., Coll. of Med., Columbus.....																					79
80	Toledo Medical College, Toledo.....			3									2			8						80
81	University of Oklahoma, School of Med., Norman.....	7		3												1	1					81
82	University of Oregon, Dept. of Med., Portland.....						1	1														82
83	Hahnemann Medical College and Hospital.—H.....	3	1	2	5		15	7		5	6	3	5	3	2	3	3	1	5		10	83
84	Jefferson Medical College.....				2		2	4	1		1		1	2								84
85	Medico-Chirurgical College.....						2															85
86	Temple University, Dept. of Medicine.....	2			2	2	2	2			3	3	1	4	3	2	2	2				86
87	University of Pennsylvania, School of Medicine.....			1			2															87
88	Woman's Medical College of Pennsylvania.....																					88
89	Univ. of Pittsburgh, School of Med., Pittsburgh.....									3	1											89
90	Medical College of the State of South Carolina.....																					90
91	Univ. of South Dakota, Coll. of Med., Vermillion.....																					91
92	Lincoln Memorial Univ., Med. Dept., Knoxville.....	27		12		1			1	15	33		5		1	2	13	12				92
93	Meharry Medical College, Nashville.....	41	2	8	1	3				12	19		7	3			24	12				93
94	Vanderbilt University, Med. Dept., Nashville.....																					94

* Information showing distribution not obtained.

† Number of students, approximate.

H.—Homeopathic.

E.—Eclectic.

[illegible]

TABLE 2.—DISTRIBUTION OF MEDICAL

Marginal Number.	NAME OF COLLEGE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Marginal Number.
		Alabama.....330	Arizona.....16	Arkansas.....177	California.....396	Colorado.....87	Connecticut.....180	Delaware.....22	Dist. of Col.....101	Florida.....127	Georgia.....598	Idaho.....36	Illinois.....1,258	Indiana.....350	Iowa.....322	Kansas.....341	Kentucky.....209	Louisiana.....212	Maine.....111	Maryland.....252	Massachusetts.....701	
95	University of Tennessee, Coll. of Med., Memphis..	24	...	28	1	1	...	...	...	3	2	...	1	...	...	...	7	22	...	...	...	95
96	Univ. of W. Tenn., Coll. of Med. & Surg., Memphis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	96
97	Texas Christian Univ., School of Med., Fort Worth	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	97
98	University of Texas, Dept. of Med., Galveston...	1	1	...	...	...	1	...	...	1	1	...	...	...	...	...	1	...	...	...	...	98
99	Baylor University, College of Medicine, Dallas...	1	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	3	...	...	...	99
100	Southern Methodist Univ., Med. Dept., Dallas...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	100
101	Univ. of Utah, School of Med., Salt Lake City...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	101
102	Univ. of Vermont, College of Med., Burlington...	...	...	...	...	...	12	...	...	...	4	...	1	...	...	...	...	...	...	...	...	102
103	Medical College of Virginia, Richmond...	...	...	...	2	...	3	...	...	1	1	...	...	1	...	...	...	5	...	11	...	103
104	Univ. of Virginia, Dept. of Med., Charlottesville...	2	2	...	...	...	...	1	1	1	3	1	...	1	...	...	...	...	...	...	...	104
105	West Virginia Univ., School of Med., Morgantown.	...	...	...	...	...	...	...	...	...	...	...	3	1	2	1	...	...	3	...	...	105
106	Marquette Univ., School of Medicine, Milwaukee.	...	...	...	...	2	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...	106
107	University of Wisconsin, Medical School, Madison.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	107
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

* Information showing distribution not obtained. † Number of students, approximate. H.—Homeopathic. E.—Eclectic.

CONTINUED FROM PAGE 675

College	B.S. and M.D.	A.B. and M.D.
University of Alabama, School of Medicine.....	6	1
Leland Stanford Junior University, School of Med...	7	7
University of California, College of Medicine.....	7	7
College of Physicians and Surgeons, Los Angeles....	6	6
College of Medical Evangelists, Loma Linda*.....	7	7
University of Colorado, School of Medicine.....	6	7
Yale Medical School, New Haven.....	6	6
George Washington University Medical School.....	6	7
Georgetown University, School of Medicine.....	6	...
University of Georgia, Medical Department.....	6	...
Bennett Medical College, Chicago.....	6	...
Chicago College of Medicine and Surgery, Chicago....	6	...
Northwestern University Medical School, Chicago....	6	...
Rush Medical College (University of Chicago).....	6	7
University of Illinois, College of Medicine.....	6	...
Indiana University, School of Medicine.....	6	7
State University of Iowa, College of Medicine.....	6	7
State University of Iowa, College of Homeopathic Medicine, Iowa City—H.....	6	7
University of Kansas, School of Medicine.....	...	6
University of Louisville, Medical Dept., Louisville...	6	...
Tulane University of Louisiana, School of Medicine...	...	7
University of Maryland, School of Medicine.....	...	7
Boston University, School of Medicine—H.....	6	...
Tufts College Medical School, Boston.....	...	7
University of Michigan, Dept. of Med. and Surg....	6	7
University of Michigan, Homeopathic Medical College	6	7
University of Minnesota, Medical School†.....	7	8
University of Mississippi, Department of Medicine...	6	...
University of Missouri, School of Medicine.....	...	6 (4)
St. Louis University, School of Medicine.....	6	...
University of Nebraska, College of Medicine.....	6	7
Dartmouth Medical School, Hanover.....	6 (4)	7 (5)
Albany Medical College, Albany.....	...	7
Columbia University, College of Phys. and Surg....	6	7
Cornell University Medical College, New York.....	...	7
Fordham University School of Medicine, New York...	6	...
University and Bellevue Hospital Medical College...	6	7
Syracuse University, College of Medicine, Syracuse...	6	7
University of North Carolina, School of Medicine...	6 (4)	...
Shaw University, Leonard Medical School.....	6 (4)	...
Wake Forest College, School of Medicine, Wake Forest	6 (4)	6 (4)
University of North Dakota, School of Medicine...	...	6 (4)
Western Reserve University, School of Medicine...	...	7
Medical College of the University of Cincinnati...	6	7
Ohio State University College of Medicine.....	6	7
University of Oklahoma, School of Medicine.....	6	...
Temple University, Department of Medicine.....	...	7
University of Pennsylvania School of Medicine.....	6	...
University of Pittsburgh, School of Medicine.....	...	6
University of South Dakota, College of Medicine...	7	7
University of Tennessee, College of Medicine.....	6	7
University of Texas, Department of Medicine.....	6 (4)	...
University of Utah, School of Medicine.....	6	...
University of Virginia, Department of Medicine...	6	...
Marquette University, School of Medicine.....	6 (4)	7 (5)
University of Wisconsin, Medical School.....	...	...

* This college requires a five-year course in medicine and theology, and the combined arts-medical-theological course is seven years.

† Two years in college and five years in medicine are required for the B.S. and M.D. degrees, three years in college and five years in medicine for the A.B. and M.D. degrees. The five-year medical course includes the hospital intern year.

The Association of American Medical Colleges

The requirements for admission to and graduation from colleges holding membership in this association are as follows:

SECTION 1.—Every college holding membership in this Association shall, on and after Jan. 1, 1912, require for matriculation a completed or unconditioned medical student's certificate, to be granted by a state medical examining and licensing board, or a board empowered by statute to grant such certificates, or a certificate of entrance to the academic department of any state university, or a certificate of entrance to an accredited university or college, providing that said certificate is granted on no less than the following requirements:

(a) A bachelor's degree from an accredited college or university.

(b) A diploma and transcript of record from a fully accredited high school, normal school or academy requiring for admission evidence of the completion of a standard course in primary and intermediate grades, and for graduation, the completion of a standard four-year high-school course, embracing two years (2 units) of mathematics, two years (2 units) of English, two years (2 units) of one foreign language, one year (1 unit) of American history and civics, and seven years (7 units) of further credit in language, literature, history or science, making the total of units at least fourteen; and in addition, one year each of physics, chemistry and biology of college grade of each not less than eight semester hours.

(c) An examination in the following branches totaling 14 units:

(A) Required, 7 units.	Units
Mathematics (minimum 2 years, maximum 3 years), algebra and plane geometry.....	2
English (minimum 2 years, maximum 4 years).....	2
One foreign language (minimum 2 years, maximum 4 years).....	2
History (U. S.) and civics.....	1
Total number of required units.....	7

(B) Elective, 7 units.

To be selected from the following:

	Units
English language and literature (in addition to the required work).....	1 to 2
Foreign languages, additional, Latin, German, Italian, French, Spanish or Greek (not less than 1 year in any one).....	1 to 4
Advanced mathematics, advanced algebra, solid geometry and trigonometry (½ year each).....	1
Natural science, chemistry 1 year, physics 1 year, and biology, botany, physiology and zoology (½ to 1 year each).....	½ to 2
Earth science, physical geography, geology and agriculture (½ year to 1 year each).....	½ to 1
Astronomy (½ year).....	½
Drawing (½ to 1 year).....	½ to 1
History, ancient, medieval and modern, and English (1 year each).....	1 to 3
Economics (½ year).....	½
Manual training (1 year).....	1
Book-keeping (½ to 1 year).....	½ to 1

And in addition one year each of physics, chemistry and biology of college grade, of each not less than 8 semester hours.

One unit in any subject is the equivalent of work in that subject for four or five periods per week for a year of at least thirty-six weeks, periods to be not less than forty-five minutes in length. One unit is equivalent to 2 semester credits or 2 points.

THE PRELIMINARY COLLEGE YEAR

(a) The preliminary college year shall extend through one college session of at least thirty-two weeks of actual instruction, including final examinations.

(b) In excellence of teaching and in content, the work of this preliminary college year shall be equal to the work done in the freshmen year in standard colleges and universities.

(c) This preliminary college year shall include courses in physics, chemistry, biology and German or French, each course to embrace at least eight semester hours of didactic and laboratory work in each subject as shown in the following schedule, provided that a student may satisfy the requirement of physics in presenting one unit of high-school physics and completing a half year of college physics which continues physics and does not duplicate the work done in the high school; provided also that a student may satisfy the requirement of French or German by presenting two units of regular high-school work in either language and completing a half year of college work in that language, which con-

Marginal Number.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	Marginal Number	
Michigan.....	479																																	
Minnesota.....	302																																	
Mississippi.....	279																																	
Missouri.....	528																																	
Montana.....	30																																	
Nebraska.....	277																																	
Nevada.....	3																																	
New Hampshire.....	42																																	
New Jersey.....	382																																	
New Mexico.....	7																																	
New York.....	2,100																																	
North Carolina.....	473																																	
North Dakota.....	62																																	
Ohio.....	791																																	
Oklahoma.....	128																																	
Oregon.....	103																																	
Pennsylvania.....	1,341																																	
Rhode Island.....	76																																	
South Carolina.....	271																																	
South Dakota.....	50																																	
Tennessee.....	499																																	
Texas.....	573																																	
Utah.....	55																																	
Vermont.....	83																																	
Virginia.....	427																																	
Washington.....	88																																	
West Virginia.....	202																																	
Wisconsin.....	329																																	
Wyoming.....	11																																	
Philippines, etc.....	126																																	
Foreign.....	555																																	
Totals.....	16,502																																	

95	96	97	98	99	100	101	102	103	104	105	106	107
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tinues and does not duplicate the work done in the high school, or by presenting three units of regular high-school work in French or German.

In the administration of the entrance requirements of the preliminary college year by the members of this Association conditions may be allowed until September, 1917, amounting to not more than one-half of the requirement in physics and one-half of the requirement in a modern language.

All such conditions shall be removed before registration for the second year.

SCHEDULE

Subject	Lectures or Recitations Per Week	Laboratory Periods* Per Week	Total Hours Per Semester	Total Semester Hours Per Year
Physics, 1..	2	2	4	8
Chemistry, 1	2	2	4	8
Biology, 1..	2 or 3	2 or 1	4	8
German or French, 2	4 or 3	.....	4 or 3	8 or 6
Total	10	6 or 5	16 or 15	32 or 30

* Each laboratory period must extend over at least two hours.

OR, EXPRESSED IN CLASS HOURS:

Subject	Total Hours Lectures, or Recitations	Total Hours Laboratory Work	Total Minimum Hours Didactic and Laboratory
Physics, 1..	64	128	192
Chemistry, 1.	64	128	192
Biology, 1..	64 or 96	128 or 64	192 or 160
German or French, 2..	128 or 96	.....	128 or 96
Totals	320	384 or 320	704 or 640

(d) In medical colleges planning to give the work of the preliminary year, provision should be made for full-time expert teachers in the various subjects. Sufficient equipment should be provided to enable the students to do the work intelligently—in amount such as will compare favorably with the equipment for these courses in standard colleges and universities.

(e) It should be remembered that the chief object of the work of the preliminary college year is to provide the student with a training that will enable him to enter more readily and intelligently on the study of the fundamental medical sciences in the medical school.

Sec. 2.—The examination of credentials must be conducted by and under the authority of the board of medical examiners of the state in which the college is located, or by a duly authorized examiner of the college entrance examination board, or the authorized examiner of an accredited university, state or otherwise, or by an examiner whose certificates are accepted by accredited colleges or universities, or by a method approved by the judicial council of this association.

Sec. 3.—The term "accredited" as applied to high schools, academies, colleges and universities means institutions of that type that have been investigated and are accredited by the state university of their respective states, by the North Central Association of Colleges and Secondary Schools, the Association of Colleges and Preparatory Schools of the Southern States, the Association of Colleges and Preparatory Schools of the Middle States and Maryland, the New England College Entrance Certificate Board, the Association of American Universities and the Association of State Universities, provided that such accrediting is based on Article III, Section 1, of this constitution.

Sec. 4.—Colleges in membership in this Association may honor the official credentials presented by students from other colleges having the standard requirements maintained by members of this Association, excepting for the fourth year of the course, but no member of this Association shall admit a student to advanced standard without receiving from the dean, secretary or registrar of such college a direct written communication certifying to the applicant's standing. Credit for time or scholarship cannot be given beyond that of the college issuing the credentials, except by mutual agreement between the colleges.

Sec. 5.—Candidates for the degree of Doctor of Medicine shall have attended four courses of study in four calendar years, each annual course to have been of not less than thirty-two teaching weeks' duration, and at least ten months shall intervene between the beginning of any course and the beginning of the preceding course.

Sec. 6.—No time credit shall be given to holders of a Bachelor's degree, but subject credit may be given on satisfactory examination. Four years of residence in a medical college shall be required of all candidates for the degree of Doctor of Medicine.

Sec. 7.—A college which gives less than a four years' course of study, but does not graduate students, and is possessed of other required qualifications, may be admitted to membership.

Sec. 8.—Each student shall be obliged to attend not less than 80 per cent. of the exercises in every annual course of study for which he seeks credit. No student shall be given credit on examination unless he attains a grade of at least 70 per cent. or its equivalent in any other marking system. And no student shall be graduated unless he shall have attained a passing grade in each and all subjects of the required curriculum.

CURRICULUM

SECTION 1.—The entire course of four years shall consist of at least 4,000 hours for each student, and shall be grouped in divisions and subdivided into subjects; each division and subject to be allotted the number of hours as shown in the following schedule:

DIVISION 1.—ANATOMY, 720 Hours (18 per Cent.)

	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) Gross anatomy (including applied anatomy)	510				120	390
(b) Histologic and microscopic anatomy	135				30	105
(c) Embryology	75				30	45

DIVISION 2.—PHYSIOLOGY AND CHEMISTRY, 600 Hours (15 Per Cent.)

	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) Inorganic chemistry	180				60	120
(b) Organic chemistry	75				30	45
(c) Physiologic chemistry	104				30	75
(d) Physiology	240				140	100

DIVISION 3.—PATHOLOGY, BACTERIOLOGY AND HYGIENE, 450 Hours (11.25 Per Cent.)

	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) Bacteriology	135				30	105
(b) Hygiene and general dietetics	45				45	
(c) Pathology	270				60	210

DIVISION 4.—PHARMACOLOGY, MATERIA MEDICA AND THERAPEUTICS, 240 Hours (6 Per Cent.)

	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) Pharmacology	105				40	65
(b) Materia medica and pharmacology	80					
(c) Therapeutics	55					

DIVISION 5.—MEDICINE AND MEDICAL SPECIALTIES, 970 Hours (24.25 Per Cent.)

	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) General medicine (including clinical microscopy)	640					
(b) Pediatrics	150					
(c) Nervous and mental diseases	105					
(d) Jurisprudence, ethics and economics	30					
(e) Dermatology and syphilis	45					

TABLE 3.—MEDICAL STUDENTS SHOWN BY CLASSES

Name of College	Enrolled During 1913-14					Name of College	Enrolled During 1913-14				
	1st Yr.	2d Yr.	3d Yr.	4th Yr.	Total		1st Yr.	2d Yr.	3d Yr.	4th Yr.	Total
Birmingham Medical College.....	.....	.....	23	34	57	John A. Creighton Medical College.....	49	51	47	85	182
Univ. of Alabama School of Med.....	33	28	13	15	94	Univ. of Nebraska Coll. of Med.....	28	30	13	13	84
Univ. of Ark. Med. Dept., Little Rock..	18	15	21	41	95	Cotner University Medical College.—E.....	5	11	8	5	29
College of P. and S., San Francisco....	9	4	7	14	34	Dartmouth Medical School, Hanover.....	10	7	.....	6	23
Hahnemann Med. Coll. of Pacific.—H.....	16	8	5	11	40	Albany Medical College, Albany.....	83	67	53	55	258
Leland Stanford Jr. Univ. Sch. of Med.....	27	18	16	14	75	Columbia Univ. College of P. and S.....	89	60	88	71	308
University of California Coll. of Med.....	45	45	19	15	124	Cornell Univ. Med. Coll., New York City..	36	32	20	20	108
Cal. Elec. Med. Coll., Los Angeles.—E.....	9	2	2	25	38	Fordham Univ. School of Medicine.....	62	46	38	29	175
College of P. and S., Los Angeles.....	61	23	30	36	153	Long Island Coll. Hosp., New York City..	97	95	79	89	360
Oakland Coll. of M. and S., Oakland.....	5	3	4	3	15	New York Homeopathic Medical College					
Coll. of Med. Evangelists, Loma Linda.....	21	14	14	23	75	and Flower Hospital.—H.....	47	66	70	54	237
Univ. of Colorado School of Medicine....	13	18	7	16	54	New York Medical College and Hospital					
Yale Medical School, New Haven.....	23	11	7	8	49	for Women.—H.....	14	12	9	7	42
George Washington Univ. Med. School....	76	48	27	20	171	University and Bellevue Hospital Medi-					
Georgetown Univ. School of Medicine....	11	16	40	32	99	cal College, New York.....	101	44	102	86	333
Howard University School of Medicine....	21	24	31	34	110	Syracuse University College of Med.....	34	32	13	17	96
Atlanta Medical College, Atlanta.....	77	131	139	138	485	Univ. of Buffalo Med. Dept., Buffalo....	90	44	55	47	236
Georgia Coll. of Elec. Med. and Surg....	2	19	9	21	51	Leonard Medical School, Raleigh.....	12	12	26	26	76
Southern Coll. of M. and S., Atlanta.....	4	8	14	23	49	Univ. of North Carolina, School of Med..	38	22	.....	.....	60
University of Georgia, Med. Dept.....	21	6	8	20	55	North Carolina Med. Coll., Charlotte....	28	13	22	28	91
Bennett Medical College, Chicago.....	93	118	81	111	403	Wake Forest School of Medicine.....	17	11	.....	.....	28
Chicago College of Med. and Surgery....	161	165	115	191	633	Univ. of North Dakota School of Med....	9	5	.....	.....	14
Chicago Hospital College of Medicine....	.....	.....	.....	.....	75	Cleveland-Pulte Medical College.....	10	13	19	11	53
Hahnemann Med. Coll. and Hosp.—H.....	32	22	21	17	92	Western Reserve University School of					
Jenner Medical College, Chicago.....	98	53	30	18	199	Medicine, Cleveland.....	35	48	40	34	157
Northwestern Univ. Med. Sch., Chicago..	33	31	53	70	187	Eclectic Med. Coll., Cincinnati.—E.....	24	21	21	21	87
Rush Medical College, Chicago.....	131	131	106	91	462	University of Cincinnati Medical College	19	12	15	14	60
University of Illinois Coll. of Med.....	62	133	106	116	422	Ohio State University Coll. of Med.....	114	69	43	58	284
Indiana University School of Medicine....	45	37	27	24	133	Toledo Medical College, Toledo.....	3	3	6	7	19
State University of Iowa College of						Univ. of Oklahoma School of Med.....	44	18	17	15	94
Medicine, Iowa City.....	34	35	26	13	108	Univ. of Oregon Dept. of Med., Portland..	14	19	20	26	79
State University of Iowa College of						Hahnemann Med. Coll. and Hosp., Phila..	37	21	21	14	93
Homeo. Med., Iowa City.—H.....	3	.....	2	.....	5	Jefferson Medical College, Philadelphia..	134	193	154	167	648
University of Kansas School of Med.....	50	29	15	11	105	Medico-Chirurgical Coll. of Philadelphia..	101	77	85	87	350
University of Louisville Med. Dept.....	96	60	67	55	278	Temple Univ. Dept. of Med., Philadelphia	19	20	29	33	101
Tulane Univ. of La. School of Medicine..	70	76	83	93	327	Univ. of Pennsylvania School of Med.....	65	68	57	76	266
Medical School of Maine, Portland.....	13	10	21	20	64	Woman's Med. College of Pennsylvania....	26	17	31	19	93
College of P. and S., Baltimore.....	31	34	58	61	184	University of Pittsburgh, School of Med..	38	27	14	45	124
Johns Hopkins University Med. Dept.....	89	88	91	92	360	Medical Coll. of the State of S. Carolina	29	22	28	25	104
Univ. of Maryland School of Medicine....	98	103	133	117	451	Univ. of South Dakota College of Med....	5	9	.....	.....	14
College of P. and S., Boston.....	48	21	22	22	113	Lincoln Memorial University Med. Dept..	13	29	19	14	75
Medical School of Harvard University....	68	67	94	76	305	Meharry Medical College, Nashville.....	114	80	84	81	359
Tufts College Medical School, Boston....	111	72	63	75	311	Vanderbilt Univ. Med. Dept., Nashville..	134	74	105	68	381
Detroit College of Med. and Surg.....	92	60	42	55	249	University of Tennessee College of Med....	72	84	82	83	321
University of Michigan Department of						Univ. of West Tenn. Coll. of M. and S....	8	10	26	29	73
Med. and Surg., Ann Arbor.....	106	85	52	39	282	Texas Christian Univ. School of Med.....	18	5	13	12	48
Univ. of Mich. Homeo. Med. College....	18	12	18	25	73	Univ. of Texas Dept. of Med., Galveston..	86	36	27	23	172
Univ. of Minnesota Medical School.....	65	36	37	31	169	Baylor University Coll. of Med., Dallas..	5	15	13	18	51
Univ. of Mississippi Dept. of Med.....	18	17	.....	.....	35	Southern Methodist Univ. Med. Dept.....	12	8	.....	.....	20
Univ. of Missouri School of Medicine....	33	22	.....	.....	55	University of Utah School of Medicine....	18	14	41	44	117
Kansas City Hahn. Med. Coll.—H.....	13	9	11	13	46	Medical College of Virginia, Richmond....	105	88	97	96	386
Eclectic Med. Univ., Kansas City.....	23	16	12	14	65	University of Virginia Dept. of Med.....	38	23	24	19	104
Ensworth Medical College, St. Joseph....	36	35	33	34	146	West Virginia University School of Med..	13	8	.....	.....	21
American Medical College, St. Louis....	60	49	48	47	204	Marquette University School of Med.....	13	51	53	52	169
St. Louis Univ. School of Medicine....	8	3	13	24	48	University of Wisconsin Medical School..	61	22	.....	.....	83
St. Louis College of P. and S.....	15	3	23	15	61						
Washington Univ. Med. Sch., St. Louis..											

* Figures are approximate. † There were 262 students in the first two years.

Note.—This table gives for each college, from which the information was obtainable, the number of students enrolled in each of the four classes. Some colleges do not publish classified lists of their students. Nine colleges teach only the work of the first two years. Birmingham Medical College taught only juniors and seniors and the Ensworth Medical College of St. Joseph, Mo., taught only seniors.

This table is very interesting in the light of the rapid trend toward higher entrance requirements and should be studied in connection with the lists of colleges given on pages 671 and 675. Some of the colleges holding to higher standards show an increase in their first year enrollments, thereby recovering from the reductions which immediately followed the adoption of the higher standards. Such increases are shown for Yale Medical School, Rush Medical College, University of Kansas School of Medicine, University of Michigan Department of Medicine and Surgery and the University of Minnesota Medical School.

In numerous instances a larger freshman class shows a college which has continued to hold to a high school education or lower standards for entrance while the majority of medical colleges have voluntarily raised their requirements for admission to one or two years of collegiate work. Among such colleges which have increased freshman classes are: College of Physicians and Surgeons, Los Angeles; George Washington University Medical School; Jenner Medical College; University of Louisville Medical Department; Tufts College Medical School; University of Buffalo Medical Department; Ohio State University College of Medicine; Medico-Chirurgical College, Philadelphia; Vanderbilt University Medical Department and the Medical College of Virginia. Smaller freshman classes will be the rule for these colleges next session, however, since practically all of them hereafter require at least one year of collegiate work for admission in addition to a high school education.

The actual enforcement of higher preliminary standards always results in a decreased enrollment. Atlanta Medical College vigorously enforced a high school educational requirement and reduced its entering class by almost half. That the University of Illinois College of Medicine and Marquette University School of Medicine enforced for the first time the preliminary requirement of one year of collegiate work is evidenced by the smaller freshman classes enrolled.

The six colleges having the largest enrollments are Jefferson Medical College, 648; Chicago College of Medicine and Surgery, 633; Atlanta Medical College, 483; Rush Medical College, 462; University of Maryland School of Medicine, 454, and the University of Illinois College of Medicine, 422. There are twenty-eight medical colleges each of which has over 200 students enrolled.

DIVISION 6.—SURGERY AND SURGICAL SPECIALTIES, 720 Hours

(18 Per Cent.)	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) General surgery	510	...	...	...	...	...
(b) Orthopedic surgery	45	...	...	...	...	...
(c) Genito-urinary diseases	45	...	...	...	...	...
(d) Eye	60	...	...	...	...	...
(e) Ear, nose and throat.....	60	...	...	...	...	...

DIVISION 7.—OBSTETRICS AND GYNECOLOGY, 300 Hours

(7.5 Per Cent.)	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) Obstetrics	195	...	...	...	...	...
(b) Gynecology (including some abdominal surgery)	105	...	...	...	...	...

Colleges may reduce the number of hours in any subject not more than 20 per cent. provided that the total number of hours in a division is not reduced. Where the teaching conditions in a college are best subserved, the subject may be, for teaching purposes, transferred from one division to another. When didactic and laboratory hours are specified in any subject, laboratory hours may be substituted for didactic hours.

SEC. 2.—Each medical college in membership in the Association shall print in every annual catalogue or announcement a table of the total number of hours work given in said college, arranged both by subjects and years.

SEC. 3.—Each college in membership in this Association shall print annually a list of its students by classes.

MEMBERS OF ASSOCIATION

University of Alabama School of Medicine.
 Leland Stanford Junior University School of Medicine.
 University of California College of Medicine.
 College of Physicians and Surgeons, Los Angeles.
 University of Colorado School of Medicine.
 Yale Medical School.
 Georgetown University School of Medicine.
 George Washington University Medical School.
 Howard University School of Medicine.
 University of Georgia Medical Department.
 Northwestern University Medical School.
 Rush Medical College.
 University of Illinois College of Medicine.
 Indiana University School of Medicine.
 State University of Iowa College of Medicine.
 University of Kansas School of Medicine.
 University of Louisville Medical Department.
 Tulane University of Louisiana School of Medicine.
 College of Physicians and Surgeons, Baltimore.
 Johns Hopkins University Medical Department.
 University of Maryland School of Medicine.
 Medical School of Harvard University.
 Tufts College Medical School.
 Detroit College of Medicine and Surgery.
 University of Michigan Department of Medicine and Surgery.
 University of Minnesota Medical School.
 University of Mississippi School of Medicine.
 St. Louis University School of Medicine.
 University of Missouri School of Medicine.
 Washington University Medical School.
 John A. Creighton Medical College.
 University of Nebraska College of Medicine.
 Columbia University College of Physicians and Surgeons.
 Cornell University Medical College.
 Syracuse University College of Medicine.
 University and Bellevue Hospital Medical College.
 University of Buffalo Medical Department.
 University of North Carolina School of Medicine.
 Wake Forest College School of Medicine.
 University of North Dakota School of Medicine.
 Medical College of the University of Cincinnati.
 Ohio State University College of Medicine.
 Western Reserve University School of Medicine.
 University of Oklahoma School of Medicine.
 Hahnemann Medical College and Hospital, Philadelphia.
 University of Pennsylvania School of Medicine.
 University of Pittsburgh School of Medicine.
 University of the Philippines College of Medicine and Surgery.
 Meharry Medical College.
 Vanderbilt University Department of Medicine.
 University of Texas Medical Department.
 University of Utah School of Medicine.
 University of Vermont College of Medicine.
 Medical College of Virginia.
 University of Wisconsin Medical School.

The secretary-treasurer of the Association is Dr. Fred. C. Zapffe, 3431 Lexington Street, Chicago.

COLLEGE NOTES

Colleges Closed During the Year.—Six medical colleges have been reported as closed during the year, of which two were closed by merger into other colleges. The colleges are:

Georgia College of Eclectic Medicine and Surgery, Atlanta.
 Southern College of Medicine and Surgery, Atlanta, Ga. This college was closed, it is reported, following withdrawal of recognition by the Georgia State Board of Medical Examiners.

Ensworth Medical College, St. Joseph, Mo. This college graduated its last class and voluntarily closed.

North Carolina Medical College, Charlotte, N. C. This college was merged with the Medical College of Virginia at Richmond.

Toledo Medical College, Medical Department of the Toledo University. Reported closed following withdrawal of recognition by the Ohio State Medical Board.

Lincoln Memorial University, Medical Department, Knoxville, Tenn. Merged with the University of Tennessee, College of Medicine at Memphis.

Special Items Concerning Medical Education

Alabama.—The University of Alabama School of Medicine will require two years of collegiate work for admission beginning with the session of 1915-16.

—The Alabama State Board of Medical Examiners has adopted two years of collegiate work as the minimum standard of preliminary education which will apply to all candidates matriculating in the session of 1915-16 and thereafter who desire to secure licenses to practice medicine in Alabama. It affects all graduates of 1919 and thereafter.

California.—The Leland Stanford Junior University, School of Medicine, received a gift of \$10,000 by the will of Charles G. Latrop.

—A sum of \$615,750 was obtained from various donors by the University of California Medical Department and used for building a new teaching hospital.

Colorado.—The faculty of the University of Colorado, School of Medicine, has undergone a complete reorganization. In place of the medical senate there is now an executive committee of five members, including the dean as chairman. Three standing committees on curriculum, hospitals and dispensary have been appointed, the chairman of each being a member of the executive committee.

Connecticut.—Yale Medical School has received \$500,000 from the General Education Board (the Rockefeller Foundation), on condition that the school procure complete control of the New Haven General Hospital and that the professors in the main clinical branches be placed on the full-time or university basis.

—Yale Medical School has also received a gift of \$400,000 by the will of the late Mrs. George Lauder to establish a chair of public health.

Georgia.—The Georgia legislature appropriated \$30,000 for the Medical Department of the University of Georgia for maintenance for two years.

Illinois.—Beginning with the session of 1914-15 all matriculants in medical colleges who expect to secure licenses in Illinois must have completed at least one year in a college of liberal arts before entering on the study of medicine or have its full equivalent in a medical school giving the five-year course.

—The alumni of Rush Medical College have raised \$10,000 toward a sum of \$30,000 to be added to the endowment fund of their Alma Mater. This college has limited its enrolment to 100 students in each of the first and second years and 120 students in each of the third and fourth years.

—A sum of \$1,000,000 has been donated by Mr. James Deering to Wesley Hospital of Chicago to be used as an endowment fund for charity beds. It is provided that Wesley Hospital be a teaching hospital with a staff made up from the faculty of the Northwestern University Medical School.

Indiana.—The Robert W. Long State Hospital at Indianapolis, the teaching hospital of the University of Indiana School of Medicine, has been completed at a total cost of \$225,000, which was the gift of Dr. and Mrs. Robert W. Long. The University of Indiana has also received a gift of 160 acres of Texas land, the proceeds from the sale of which will go toward the maintenance of the Long Hospital.

Maryland.—The General Education Board (the Rockefeller Foundation) has given to the Medical Department of Johns Hopkins University a gift of \$1,500,000 in order that the professors of the three main clinical departments might be placed on a full-time or academic basis. Another gift of \$50,000 from the same source was obtained, to be used in the developing of the Hunterian laboratories.

—Another gift of \$250,000 was received by Johns Hopkins University, Medical Department, from James Buchanan Brady for a urological clinic which will be known as the Brady Urological Clinic. Mr. Brady's gift also provides for \$15,000 annually for maintenance.

—The Johns Hopkins University, Medical Department, has limited its enrolment to 90 students in each class.

—The endowment funds being raised for the University of Maryland School of Medicine, by its alumni, amounted in the last report to \$31,633, of which about one-third is for the pathological endowment fund and two-thirds for the faculty of physic fund. The university is making an effort also to secure some endowed scholarships.

Massachusetts.—Harvard University is to receive "a greater part" of an estate of \$500,000—exact amount not stated—to be used for medical research.

—The Peter Bent Brigham Hospital at Boston has been completed at a cost, including the land and the erection of the buildings, of \$1,350,000. The grounds immediately adjoin the campus of the Medical School of Harvard University. This hospital has remaining a fund of \$4,500,000 to provide an income for maintenance.

Michigan.—Detroit College of Medicine and Surgery is reported to have raised \$100,000 toward a \$1,000,000 endowment fund.

Minnesota.—The University of Minnesota Medical School has established teaching fellowships in the clinical departments, with a view of providing well-trained, full-time assistants and research workers and at the same time give a basis for graduate instruction in the specialties. The fellowships are in three grades: first year, \$500; second year, \$750, and third year, \$1,000.

—The University of Minnesota, Medical School, has provided a graduate course of two years for the training of specialists in ophthalmology, and opportunity will be provided so that courses in otology, laryngology and rhinology may be taken at the same time. A suitable degree will be granted at the end of the course.

Missouri.—Washington University Medical School received a gift of \$150,000 by the will of Adolphus Busch. From the General Education Board \$750,000 was received on condition that, from other sources, the sum be increased to \$1,500,000, and that it be used to place the professors of the main clinical chairs on a full-time or academic basis.

—The new group of buildings for the Washington University Medical School, the Barnes Hospital and the St. Louis Children's Hospital have been completed on the new campus at Kingshighway and Euclid Avenue, St. Louis. The total cost exceeds \$1,000,000. There is also a fund of \$2,000,000, the income from which provides for the maintenance of the Barnes Hospital.

Nebraska.—The University of Nebraska, College of Medicine, has moved into its new building on the Omaha campus, and now all four years of the medical course are given in Omaha. The new building was erected at a cost of \$115,000.

New York.—A closer affiliation has been established between the Columbia University, College of Physicians and Surgeons and the Presbyterian Hospital which gives to the former larger teaching privileges.

—Columbia University received \$200,000 from the family of the late W. Bayard Cutting for traveling fellowships open to graduates of the university, including the medical school. Other gifts were \$2,500 for surgical research and \$1,000 for salaries in the department of physiology.

—The Long Island College Hospital received \$20,000 by the will of Mrs. Matilda E. Webb.

—Under the will of the late Dr. Roswell Park, his entire library consisting of about three thousand volumes was given to the University of Buffalo, Medical Department.

—The New York Homeopathic Medical College and Flower Hospital has received a donation of \$25,000 for research work in cancer.

—The University and Bellevue Hospital Medical College received a gift of \$10,000 by the will of the late Dr. Joseph D. Bryant to provide for a more thorough teaching of medical ethics.

—Albany Medical College received a gift of \$5,000 by the will of Sylvester McDonald. Another gift of \$10,000 was received by the will of Dr. John M. Bigelow.

—Cornell University, Medical College, received as an endowment \$4,000,000 from (it is believed) Col. Oliver Hazard Paine of New York City. This is perhaps the largest individual gift ever made to a medical school. The gift provides an annual income of about \$200,000.

—The endowment of the Rockefeller Institute for Medical Research has been increased by its founder by \$2,500,000. An additional \$1,000,000 was given to establish a department of animal pathology. The total gifts by Mr. Rockefeller to the institute now amounts to \$12,500,000. Mr. James J. Hill gave \$50,000 to the new department of animal pathology to use in the study of hog cholera. Dr. Theobald Smith, formerly professor of comparative pathology at the Medical School of Harvard University, has been made director of this new department.

Ohio.—The Medical College of the University of Cincinnati has received from the will of Mrs. Francis W. Gibson the sum of \$31,400 to go toward the endowment fund. A gift of \$25,000 was received by the will of Mrs. Jeanette Moss to endow the chair of medicine.

Oregon.—A site for the University of Oregon, Department of Medicine, valued at \$100,000 has been donated by the Oregon-Washington Railroad and Navigation Company, with the stipulation that the site be occupied by a hospital or by institutions for the furtherance of scientific research and teaching.

Pennsylvania.—The Woman's Medical College of Pennsylvania has received \$22,500 toward a \$500,000 endowment fund. An appropriation of \$10,000 was made by the Pennsylvania legislature for the Hospital of the Woman's Medical College of Pennsylvania.

—Jefferson Medical College has purchased for \$12,000 a three-story brick building adjoining the Baugh (Jefferson College) Institute of Anatomy.

—The University of Pennsylvania School of Medicine has received gifts as follows: \$15,000 to endow three beds in the children's orthopedic ward of the University Hospital; a residuary fund of \$1,500,000 for the University library, the University Hospital, and the departments of dermatology, archeology and paleontology. The faculty has voted to admit women students beginning this fall.

—The University of Pittsburgh School of Medicine has received as a gift the library of the late Prof. Ernest Zeisler, for many years professor of pathology at the University of Freiburg, which was purchased for the University by Mr. Richard Beatty Mellen. In addition to the above Mr. Mellen has endowed a fellowship in internal medicine and also provided funds to install and maintain an electrocardiographic apparatus.

—A scholarship amounting to \$12,000 for the benefit of women students has been provided at the University of Pittsburgh School of Medicine by a congress of the women's clubs of western Pennsylvania.

Tennessee.—Vanderbilt University, Medical Department, has been made secure in its rights to use the \$1,000,000 given last year by Mr. Andrew Carnegie. This was brought about by the supreme court decision that the Board of Trustees of Vanderbilt University and not the General Conference of the Methodist Episcopal Church had the right to fill vacancies on that board.

Total Gifts During the Year.—During the last twelve months, so far as reports indicate, the total gifts for new laboratories and medical-school buildings was approximately, \$567,500; for endowments and maintenance, \$8,163,500; for research and public health instruction in medical schools, \$675,000, a total of \$9,406,000. If to this is added the \$4,010,750 given to build and maintain teaching hospitals and the \$3,550,000 given for medical research at the Rockefeller Institute, the grand total of donations for medical education, teaching hospital and research during the year would be \$16,966,750. This does not include the regular incomes of the medical schools for maintenance coming through the regular university channels.

Another School of Public Health

The University of Minnesota inaugurates, with the fall session, a school of public health to be administered by the medical school, through a committee in direct charge. The ranking member of its faculty will sit in the administrative board of the medical school.

It will begin with the offer of courses for medical health officers. These courses have been laid out for the ensuing year. The doctorate in medicine will be a preliminary requirement. The first year's work may, however, be taken by post seniors of the medical school in lieu of the required year of hospital internship. A certificate of proficiency in sanitary science will be given on the satisfactory completion of the first year's work. This will be followed, however, by advanced courses, for a second year, leading to a degree, probably, in public health.

The first year's curriculum will call for a total of 1,000 hours, of which 500 will be devoted to required work and 500 to elective work.

The required courses will deal with public health laws; public health organization and administration; the theory and practice of statistics; personal hygiene; school hygiene; infant mortality; the sanitation of travel; industrial hygiene; communicable diseases; sex hygiene and venereal diseases; the hygiene of milk; of water supplies and of food; sewerage; refuse collection and disposal; the sanitation of buildings; town planning; housing; labor problems; economic conditions in American cities; school supervision; general physiography; elements of psychology; municipal administration, and hospital administration.

Among the electives provided are courses in epidemiology, public health laboratories, Pasteur institute, sanitary engineering, water and sewage laboratory methods, school hygiene, vital statistics, physical and human geography, protozoology, algae, meteorology, construction and interpretation of geologic maps, infant mortality, mental retardation, experimental psychology, dairy chemistry, study of meats, and animal parasites and parasitic diseases.

The school of public health will also plan and conduct courses in sanitary and hygienic subjects in other departments of university instruction.

It will have general oversight of the health interests of the university communities and will frame sanitary regulations for the benefit of students and faculties.

MEDICAL EDUCATION IN THE UNITED STATES

The tabulated statistics herewith presented (page 657) are for the year ending June 30, 1914, and are based on reports received from the medical colleges or from other reliable sources. We take pleasure in acknowledging here the courtesy and cooperation of the various officials who have made the compilation of these complete statistics possible.

STATISTICS OF COLLEGES

Table 1 (pages 674-676) gives the colleges in session during 1913-1914; the population of the city; the rating given to the college in the third classification of the Council on Medical Education; the number of students, men and women, registered during the year; the number of 1914 graduates, men and women; the number of graduates holding collegiate degrees; the number of teachers for each college; the number of weeks of actual work in the college year; the total fees for each year; the executive officer of the college, and the dates of beginning and ending of the next session. The figures in heavy-faced type show the totals by states. Beginning on page 657 are given essential facts concerning all medical colleges arranged by states.

NUMBER OF MEDICAL STUDENTS

The total number of medical students (matriculants) in the United States for the year ending June 30, 1914, excluding premedical, special and postgraduate students, was 16,502, a decrease of 513 below last year, a decrease of 1,910 below 1912 and a decrease of 11,640 below 1904, when 28,142, the highest number of students, were enrolled. Of the total number

TABLE 4.—MEDICAL COLLEGE ATTENDANCE

Year.	Non-sectarian.	Homeopathic.	Eclectic.	Physio-Med.	Non-descript.	Total.
1880.....	9,776	1,220	830	...	...	11,826
1890.....	13,521	1,164	719	...	...	15,404
1900.....	22,710	1,909	522	...	...	25,171
1901.....	23,846	1,683	664	80	144	26,417
1902.....	24,878	1,617	765	91	150	27,501
1903.....	24,930	1,498	848	149	190	27,615
1904.....	23,662	1,309	1,014	123	234	28,142
1905.....	24,119	1,104	578	114	232	26,147
1906.....	23,116	1,085	644	110	249	25,204
1907.....	22,303	1,039	545	97	292	24,276
1908.....	20,936	891	479	90	206	22,602
1909.....	20,554	899	413	52	227	22,145
1910.....	20,136	867	455	49	19	21,526
1911.....	18,414	890	433	49	...	19,786
1912.....	17,277	827	303	...	...	18,412
1913.....	15,919	850	256	...	...	17,015
1914.....	15,438	794	270	...	...	16,502

of students, 15,438 were in attendance at the non-sectarian (regular) colleges, 794 at the homeopathic and 270 at the eclectic colleges. The attendance at the non-sectarian colleges shows a decrease of 481 below that of last year, a decrease of 1,839 below 1912 and a decrease of 9,492 (38 per cent.) below 1903, when 24,930, the largest number of non-sectarian students, were enrolled. In the homeopathic colleges there was a decrease of 55 below the attendance of last year, a decrease of 31 below 1912 and a decrease of 1,105 (58 per cent.) below 1900, when 1,909, the largest

number of homeopathic students, were enrolled. The eclectic colleges show an increase of 14 over the registration of last year but a decrease of 38 below 1912 and a decrease of 744 (73 per cent.) below 1904, when the largest number of eclectic students were enrolled.

NUMBER OF MEDICAL GRADUATES

The total number of graduates for the year ending June 30, 1914, was 3,594, a decrease of 387 below 1913, and a decrease of 889 below 1912. The total this year is 2,153 (37.5 per cent.) less than in 1904, when 5,747, the largest number, were graduated. The

TABLE 5.—MEDICAL COLLEGE GRADUATES

Year.	Non-sectarian.	Homeopathic.	Eclectic.	Physio-Med.	Non-descript.	Total.
1880.....	2,673	380	188	..	..	3,241
1890.....	3,853	389	221	..	..	4,454
1900.....	4,715	413	86	..	..	5,214
1901.....	4,879	387	148	18	12	5,444
1902.....	4,508	336	138	16	11	5,009
1903.....	5,088	420	149	24	17	5,698
1904.....	5,190	371	146	20	20	5,747
1905.....	5,126	276	153	22	23	5,600
1906.....	4,841	286	186	22	29	5,364
1907.....	4,591	225	121	11	32	4,980
1908.....	4,370	215	116	12	28	4,741
1909.....	4,163	209	84	15	44	4,515
1910.....	4,113	183	114	16	14	4,440
1911.....	4,006	162	110	5	..	4,273
1912.....	4,206	185	92	..	..	4,483
1913.....	3,679	209	93	..	..	3,981
1914.....	3,370	154	70	..	..	3,594

number of graduates from the non-sectarian colleges was 3,365, or 314 less than last year, and 841 less than in 1912. It is a decrease of 1,825 (35 per cent.) below 1904, when 5,190, the largest number, were graduated from non-sectarian colleges. From the homeopathic colleges there were 154 graduates, or 55 less than in 1913, and 31 less than in 1912. It is a decrease of 266 (63 per cent.) below 1903, when 420, the largest number of homeopathic physicians, were graduated. The eclectic colleges graduated 70, or 23 less than last year, and 40 less than in 1911. It is a decrease of 151 (68.3 per cent.) below 1890, when 221, the largest number of eclectic physicians, were graduated.

GRADUATES HOLDING DEGREES IN ARTS

Of the 3,594 medical graduates, 807, or 22.5 per cent., were reported to hold also degrees in arts or science, as compared with 18.9 per cent. last year, 17 per cent. in 1912, 16.5 per cent. in 1911 and 15.3 per cent. in 1910. Of the 3,365 non-sectarian school graduates, 794, or 23.5 per cent., were reported to have baccalaureate degrees, while of the homeopathic graduates, 7, or 4.5 per cent., were so reported, and of the eclectic graduates, 6, or 8.6 per cent., were reported as holding degrees from colleges of liberal arts. As will be noted by referring to Table 14, of the 807 graduates holding baccalaureate degrees, 127—the largest number—came from Illinois colleges, followed by 97 from New York, 90 from Maryland, 79 from Pennsylvania and 70 from Massachusetts. It is noted that, as expected, the percentage of graduates holding collegiate degrees is gradually increasing and will con-

tinue to increase, particularly in the non-sectarian colleges, because a larger number of medical schools are requiring college work for admission.

TABLE 6.—MEDICAL GRADUATES WITH LIBERAL ARTS' DEGREES

Year	Non sectarian			Homeopathic			Eclectic			Totals		
	Graduates.	A.B., B.S.	Per cent.	Graduates.	A.B., B.S.	Per cent.	Graduates.	A.B., B.S.	Per cent.	Graduates.	A.B., B.S.	Per cent.
1910.....	4,113	661	16.1	183	13	7.1	114	3	2.6	4,410	680	15.3
1911.....	4,006	683	17.0	152	18	11.8	110	4	3.6	4,273	705	16.5
1912.....	4,206	744	17.7	185	15	8.1	92	4	4.3	4,483	763	17.0
1913.....	5,679	732	12.9	209	20	9.6	93	1	1.1	3,981	753	18.9
1914.....	3,370	794	23.5	151	7	4.5	70	6	8.6	3,591	807	22.5

WOMEN IN MEDICINE

During the past year there were 631 women studying medicine, or 9 less than last year, a decrease of 48 below 1912 and a decrease of 498 (44.1 per cent.) below 1904, when 1,129 women students, the largest number, were reported. The percentage of all medical students was 3.8, the same as last year. There were 121 women graduates this year, or 3.4 per cent. of all graduates. Of all the women matriculants, 135 (21.4 per cent.) were in attendance at the two medical colleges for women, while the remaining 496 (78.6 per cent.) were matriculated in the 54 coeducational colleges. From the two women's colleges there were 25, or 20.7 per cent. of all women graduates, while 96, or 79.3 per cent., secured their degrees from coeducational colleges.

TABLE 7.—WOMEN IN MEDICINE

Year.	Total women students.	Percentage of all students, both sexes.	Total women graduates.	Percentage of graduates, both sexes.	Women's colleges.	Students.	Percentage of all women students.	Graduates.	Percentage of all women graduates.	Co-ed. schools.	Students.	Percentage of all women graduates.	Graduates.	Percentage of all women graduates.
1904	1,129	4.3	244	4.0	3	183	16.2	56	23.0	97	946	83.8	198	77.0
1905	1,073	4.1	219	4.0	3	221	20.6	54	24.5	96	852	79.4	165	75.5
1906	895	3.5	233	4.3	3	189	21.0	33	14.1	90	706	79.0	200	85.9
1907	928	3.8	211	4.2	3	210	22.6	39	18.5	86	718	77.4	172	81.5
1908	835	3.7	185	3.9	3	186	22.3	46	24.9	88	649	77.7	139	75.1
1909	921	4.2	162	3.7	3	169	18.4	33	20.3	91	752	81.6	129	79.7
1910	907	4.2	157	3.5	3	155	17.1	41	26.1	82	752	82.9	116	73.9
1911	680	3.4	159	3.7	3	124	19.7	36	22.6	74	546	80.3	123	77.4
1912	679	3.2	142	3.2	2	143	21.1	32	22.6	64	536	78.9	110	77.5
1913	640	3.8	151	3.8	2	138	21.6	33	21.4	55	502	78.6	121	78.6
1914	631	3.8	121	3.4	2	135	21.4	25	20.7	54	496	78.6	96	79.2

NUMBER OF COLLEGES

Until last year no exact data were available on which absolute statements could be made regarding the number of medical schools existing in the various years prior to 1900. Through the work of the Council on Medical Education, however, sufficient reliable data regarding all medical schools were collected and the chart prepared which was published last year,¹ from which the actual number of schools existing in any one year could be positively stated. Table 8 allows

of comparisons between the number of colleges existing in recent years.

Since June 30, 1913, six colleges (mentioned on page 681) have suspended or merged with others, leaving 101 medical colleges still existing. The number of colleges is the smallest number since 1880. It was about that time that the movement toward establishing commercial medical colleges became most marked, and the rapid increase in the number of colleges has been paralleled only by the rapid decrease since 1904. There has been a net decrease of sixty-one colleges since 1906, when there were 162 and when this country had about one-half of the world's supply of medical colleges! Eighty-five colleges have been closed by merger or otherwise since 1904, but in the same time twenty-four new colleges were organized, leaving 101 medical colleges which still exist.

The non-sectarian (regular) colleges number 87, a decrease of 5 since last year. The homeopathic colleges number 10, the same as last year and the eclectic

TABLE 8.—MEDICAL COLLEGES

Year.	Non-sectarian.	Homeopathic.	Eclectic.	Physio-Med.	Non-descript.	Total.
1850.....	44	3	4	1	..	52
1860.....	53	6	4	2	..	65
1870.....	60	8	5	2	..	75
1880.....	76	14	8	2	..	100
1890.....	106	16	9	2	..	133
1900.....	126	22	9	2	1	160
1901.....	125	22	10	2	1	160
1902.....	126	20	9	3	2	160
1903.....	126	20	9	3	2	160
1904.....	127	19	9	3	2	160
1905.....	125	19	9	3	2	158
1906.....	130	19	8	3	2	162
1907.....	127	18	9	3	2	159
1908.....	120	18	9	2	2	161
1909.....	115	15	8	1	1	140
1910.....	109	12	8	1	1	131
1911.....	103	12	7	..	..	122
1912.....	101	11	6	..	..	118
1913.....	92	10	5	..	..	107
1914.....	87	10	4	..	..	101

tic colleges number 4, a decrease of 1 since last year. The non-sectarian colleges show a net reduction of 43, or 33.1 per cent., since 1906, when there were 130, the largest number of non-sectarian medical colleges. The homeopathic colleges show a net decrease of 12, or 54.5 per cent., since 1901, when 22, the largest number of homeopathic colleges, were in existence. The eclectic colleges show a net reduction of 6, or 60 per cent., since 1901, when there existed 10, the largest number of eclectic colleges.

FEWER BUT BETTER COLLEGES

Of the eighty-five medical colleges which have ceased to exist since 1904, forty-nine were closed by merger and thirty-five became extinct. It is noteworthy that this rapid diminution in the number of colleges began with the creation of the Council on Medical Education in 1905. The largest numbers closing in single years were ten in 1907, when the Council's first classification of medical colleges was prepared, thirteen in 1910, when the second classification was published, and fourteen in 1913, when the third classification was made public.

1. Life Chart of the Medical Colleges in the United States, THE JOURNAL A. M. A., Aug. 23, 1913, p. 578.

It is interesting to note that of the eighty-five medical colleges which have been closed, 44 were rated by the Council on Medical Education in Classes A and B and 41 in Class C. It is also interesting to note that 41, or 93 per cent. of the closures of the medical colleges in Classes A and B were through merger with other colleges, while of the Class C colleges which

TABLE 9.—COLLEGES CLOSED SINCE 1904

Year.	Class A.*		Class B.		Class C.		Totals		Total Closed
	Mgd.	Ext.	Mgd.	Ext.	Mgd.	Ext.	Mgd.	Ext.	
1905.....	8	1	..	..	..	..	8	1	9
1906.....	..	..	..	..	..	..	..	..	..
1907.....	3	..	3	1	..	3	6	4	10
1908.....	2	..	2	..	1	4	5	4	9
1909.....	3	..	3	..	..	7	5	7	12
1910.....	1	..	3	..	3	6	7	6	13
1911.....	..	..	3	..	1	3	4	3	7
1912.....	2	..	..	..	..	3	2	3	5
1913.....	3	..	6	1	1	3	10	4	14
1914.....	..	..	..	..	2	4	2	4	6
Totals...	22	1	19	2	8	33	49	35	85

* Based on the classifications of medical colleges prepared by the Council on Medical Education.

closed only six, or less than 15 per cent., were through merger with other colleges. In fact, all but three of the colleges which became extinct had been rated in Class C by the Council on Medical Education.

While the total number of colleges is growing smaller, however, and *approaching more nearly the normal supply for this country*, it is encouraging to note that the number of high-grade, stronger medical colleges is constantly increasing. In 1904 only four medical colleges were requiring any preliminary education in advance of the usual high-school education;

TABLE 10.—REDUCTIONS IN NUMBERS OF MEDICAL COLLEGES, STUDENTS AND GRADUATES

Numbers	Non-sectarian			Homeopathic			Eclectic			Totals		
	Colleges.	Students.	Graduates.	Colleges.	Students.	Graduates.	Colleges.	Students.	Graduates.	Colleges.	Students.	Graduates.
Largest....	139	24,930	5,190	22	1,909	420	10	1,014	221	162	28,142	5,747
Present....	87	15,438	3,370	10	794	154	4	270	70	101	16,502	3,594
Decrease....	43	9,492	1,820	12	1,105	266	6	744	151	61	11,640	2,153
Percentage	33.1	33.1	35.1	54.5	57.9	63.3	60.0	73.4	68.3	37.7	41.4	37.5

now there are eighty-four² requiring one or more years of advance college work and several others which begin the higher requirement next year. Of these eighty-four colleges, there are thirty-four which are requiring two years or more of collegiate work for admission. Many of the colleges have been remarkably improved also in regard to buildings, new laboratories, better equipment, larger hospital facilities and—most important—more and better full-time, salaried instructors.

FURTHER MERGERS NEEDED

There are still eighteen cities each of which has two or more medical schools, and in seven of these mergers

are scarcely possible, owing to the fact that the schools differ as to sect or race, leaving eleven cities where mergers are still possible. These cities and the number of colleges in each are as follows: Chicago, 8; New York, 7; Philadelphia, 6; Boston, 4; San Francisco, 4; St. Louis, 4; Baltimore, 3; Los Angeles, 3; Washington, 3; Dallas, 2, and Omaha, 2. In 1904 there were twenty-four cities having each from two to eight non-sectarian medical schools.

Each of the most famous medical centers in Europe—for example, Berlin, Paris, Vienna—has but one large medical school which makes systematic and practical use of the clinical facilities of the respective city. There is no valid reason why this country should not have equally famous medical centers, but the highest development is prevented by the existence of too many competing medical schools. For the further improve-

TABLE 11.—CITIES HAVING TWO OR MORE MEDICAL COLLEGES

City	A+	A	B	C	Total
Chicago.....	2	1	3	2	8
New York.....	3	1	2	1	7
Philadelphia.....	1	4	1	..	6
Boston.....	1	2	..	1	4
San Francisco.....	2	..	1	1	4
St. Louis.....	1	1	..	2	4
Baltimore.....	1	2	..	..	3
Washington.....	..	3*	..	..	3*
Los Angeles.....	..	..	1	2	3
Ann Arbor.....	1	1	..	..	2
Cincinnati.....	1	..	1	..	2
Cleveland.....	1	..	..	1	2
Dallas.....	..	..	1	1	2
Iowa City.....	1	1	..	..	2
Kansas City.....	..	..	..	2	2
Memphis.....	..	..	1	1*	2*
Nashville.....	..	2*	..	..	2*
Omaha.....	..	1	1	..	2

* One school for the colored race.

† One school contemplates removal to Columbus.

ment not only of undergraduate but also of postgraduate medical instruction in this country, there should be other mergers in the eleven cities named.

LENGTH OF TERMS

The length of term of each college fluctuates somewhat from year to year, but on the whole, during the last twelve years there has been a decided lengthening of college terms. This has reference to the weeks of actual work exclusive of holidays. Only two colleges this year reported sessions shorter than twenty-nine weeks, whereas in 1901, one hundred colleges reported sessions of from twenty-three to twenty-eight weeks. Four colleges claim courses of twenty-nine or thirty weeks of actual work, twenty-five claim courses of thirty-one or thirty-two weeks, and forty-one, the largest number, claim courses of from thirty-three to thirty-four weeks. Of the 101 colleges now existing, 94, or 94.1 per cent., now claim to require from thirty-one to thirty-six weeks of actual work, exclusive of holidays, as compared with 91.5 per cent. in 1913, 85 per cent. in 1912, 76 per cent. in 1910, 42 per cent. in 1904 and only 30 per cent. in 1901. The one college claiming a course of thirty-seven weeks is a night school, but it would require twelve or fourteen years of the usual night school study to obtain the equiva-

lent of four years of thirty-two weeks each in one of the better day colleges.

TABLE 12.—COLLEGE TERMS

Year.	23 to 26 weeks.		27 to 28 weeks.		29 to 30 weeks.		31 to 32 weeks.		33 to 34 weeks.		35 to 36 weeks.		Over 36 weeks.	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1901	58	30.5	42	26.4	8	5.0	26	16.4	4	2.5	18	11.3	3	1.9
1902	44	28.4	41	28.4	11	7.1	33	21.3	3	1.9	18	11.6	2	1.3
1903	33	21.4	46	29.9	15	9.7	37	24.0	2	1.3	19	12.4	2	1.3
1904	27	16.3	41	26.5	22	13.3	37	22.3	13	7.8	20	12.0	3	1.8
1905	15	9.4	35	21.8	12	7.5	44	27.5	13	8.1	28	23.8	3	1.9
1906	14	8.7	35	21.7	26	16.1	32	19.9	24	14.9	28	17.4	2	1.3
1907	6	3.7	27	16.8	26	16.1	42	26.1	29	18.0	29	18.0	2	1.3
1908	2	1.3	21	13.8	28	18.4	51	33.6	24	15.8	22	14.5	4	2.6
1909	4	2.3	17	11.6	23	16.4	51	34.9	18	12.3	30	20.5	3	2.0
1910	2	1.5	8	6.0	19	14.3	42	31.5	30	22.6	30	22.6	2	1.5
1911	..	...	6	5.0	16	13.3	37	30.8	32	26.7	28	23.4	1	0.8
1912	1	0.9	1	0.9	11	9.5	34	29.3	37	31.8	31	26.7	1	0.9
1913	..	...	3	2.8	5	4.7	29	27.4	41	38.7	27	25.5	1	0.9
1914	..	...	2	2.0	4	1.0	25	24.8	41	40.5	28	27.7	1	1.0

TUITION AND OTHER FEES

Special attention is called in Table 1 on Page 672 to the total amount charged by the various colleges per annum for tuition, matriculation, laboratory and graduation fees for each student. In Table 13 the 101 remaining colleges have been grouped according to the amount of fees charged and according to their classification by the Council on Medical Education in Classes A, B and C. Fourteen colleges charge fees of \$100 or less per year, sixty-six between \$100 and \$175, and twenty-one charge above \$175. Of the fourteen colleges charging \$100 or less, eight, or nearly two-thirds, were listed among Class A (acceptable) colleges³ by the Council on Medical Education, three were in Class B and three of them are found among the Class C colleges. Among the eight Class A colleges having these low fees are the schools of medicine of the state universities of Colorado, Mississippi, Missouri, North Dakota, South Dakota, Texas and Utah. On the other hand, eleven colleges listed by the Council in Class C charge fees of from \$100 to \$175 per year for each student. As shown on page 670, diplomas from Class C colleges are reported as not recognized by thirty-one state licensing boards. It is a question, therefore, why a student should spend his time and money in a low-grade college the diplomas of which are not recognized in many states,⁴ when in the same time and with even less money he can attend one of the best-equipped colleges, the diplomas of which are recognized in all states. Although thirty-seven colleges listed in Class A charge fees ranging from \$150 to \$275 per year for each student, the actual expense for teaching that student in these colleges amounts to from two or three, to several times these sums. In fact, accurate data secured from sixty-five medical colleges a few years ago showed that the average amount received each year from the individual student was \$122, while the average amount actually expended in the training of that student for

a year was \$410! The excesses of cost over income per student in several schools were, respectively, \$2,744, \$1,863, \$897, \$747, \$730, \$673, \$518 and \$500. The excess of expense over income from fees per student was over \$200 in twenty-eight of the medical colleges which reported. It is also clearly evident that with the same equipment and at practically no additional expense these schools could easily accommodate

TABLE 13.—COLLEGE FEES

Tot. Fees	Number of Colleges			
	Class A*	Class B	Class C	Total
\$ 50 or less.....	3	2	..	5
50 to \$ 75.....	5	1	1	7
75 to 100.....	..	..	2	2
100 to 125.....	11	6	6	23
125 to 150.....	12	6	4	22
150 to 175.....	18	2	1	21
175 to 200.....	12	2	..	14
200 or above.....	7	..	..	7
Totals.....	68	19	14	101

* Based on the latest classification of medical colleges prepared by the Council on Medical Education.

two, three, or in some instances several times the number of students at present enrolled, which would greatly reduce the disproportion of expense over income from fees. A further reduction in the vast oversupply of medical schools in this country, therefore, would be in the interests of economy as well as of marked advantage to medical education.

COLLEGES, STUDENTS AND GRADUATES BY STATES

Illinois has heretofore had the largest number of medical colleges, but now, as shown in Table 14, the first place is held by New York, where there are ten colleges. California and Illinois each has eight and Missouri and Pennsylvania each has seven colleges. Illinois still has the largest number of students enrolled, having 2,474 matriculants last session, followed by New York with 2,153, Pennsylvania with 1,675 and Tennessee with 1,209. In regard to the graduates, the same relative position obtains.

Table 15 shows the colleges existing during the last session and their students and graduates grouped according to their rank in the third classification of the Council on Medical Education. As will be noted, there were sixty-eight colleges in Classes A+ and A and 20 each in Classes B and C. It is encouraging to note that 74.7 per cent. of all students are enrolled in the 63 per cent. of colleges which are in Classes A+ and A, and that these colleges turn out 73 per cent. of all graduates. At the other extreme, only 8.1 per cent. of all students and 7 per cent. of all graduates are from the 18.5 per cent. of colleges rated in Class C.

HOME STATES OF MEDICAL STUDENTS

Table 2, on 676 to 679, shows from what states the students come who were in attendance at each medical college during the session of 1913-1914. The influence of the proximity of the medical school is seen in the fact that states having medical colleges contribute

3. See list on page 669.
4. See also in THE JOURNAL of May 23, 1914, p. 1650, the table showing in what states the diplomas of the various medical colleges are not given full recognition.

TABLE 14.—MEDICAL COLLEGES, STUDENTS AND GRADUATES BY STATES

State	Colleges		Students		Graduates		Graduates with B.S. or A.B.
	Total	Class C	Men	Women	Men	Women	
Alabama.....	2	..	151	..	51	...	5
Arkansas.....	1	..	94	1	34	...	1
California.....	8	3	469	85	78	14	29
Colorado.....	1	..	53	1	16	1	9
Connecticut.....	1	..	49	..	8	..	8
Dist. of Columbia.....	3	..	377	3	65	1	8
Georgia.....	2	..	646	..	186	...	7
Illinois.....	8	2	2,331	142	570	26	127
Indiana.....	1	..	128	5	20	2	10
Iowa.....	2	..	110	3	13	...	7
Kansas.....	1	..	102	3	9	1	9
Kentucky.....	1	..	278	..	54	...	5
Louisiana.....	1	..	327	..	77	...	21
Maine.....	1	..	67	..	19	...	9
Maryland.....	3	..	974	24	235	11	90
Massachusetts.....	4	1	783	56	152	9	70
Michigan.....	3	..	578	26	110	2	32
Minnesota.....	1	..	162	7	28	2	26
Mississippi.....	1	..	35	..	..	..	..
Missouri.....	7	4	615	20	150	7	30
Nebraska.....	3	1	281	14	49	2	11
New Hampshire.....	1	..	23	..	6	..	5
New York.....	10	1	2,677	76	432	15	97
North Carolina.....	3	..	252	3	36	...	5
North Dakota.....	1	..	13	1	...	...	..
Ohio.....	5	1	647	13	130	4	44
Oklahoma.....	1	..	94	..	14	...	..
Oregon.....	1	..	77	2	25	1	3
Pennsylvania.....	7	..	1,570	105	373	19	79
South Carolina.....	1	..	104	..	19	...	6
South Dakota.....	1	..	14	..	...	...	..
Tennessee.....	4	1	1,197	12	258	1	19
Texas.....	4	..	306	15	66	3	12
Utah.....	1	..	19	1	...	...	..
Vermont.....	1	..	117	..	39	...	2
Virginia.....	2	..	490	..	105	...	17
West Virginia.....	1	..	18	3	...	...	..
Wisconsin.....	2	..	243	9	43	...	4
Totals.....	101	14	15,871	631	3,473	121	807
Average per College	...	..	157	6	35	2	8

more students in proportion to the population than those which have no colleges. This is shown by the dark zone of figures running diagonally down the page. A comparison of this table with the large tables based in state board examinations,⁵ which show the distribution of the alumni of each college, is interesting. The college which has widely distributed alumni usually has a student body from an equally large number of states.

The state furnishing the largest number of students this year was New York, with 2,100. Pennsylvania contributed 1,341 and Illinois 1,258. The next states, in the order of the number of students contributed, are: Ohio, 791; Massachusetts, 701; Georgia, 598; Texas, 573; Missouri, 528, and Tennessee 499. Four states had less than 20 each, these being Arizona, 16, Wyoming, 11; New Mexico, 7 and Nevada, 3. There were 126 students from Hawaii, Porto Rico and the Philippine Islands, and 555 students from foreign countries.

In Table 3, on page 680, the students enrolled in each college are shown by classes. This permits one to see whether the attendance at each college is increasing or decreasing. The total attendance for the first year in all colleges is larger than that of the second year by 703. More interesting, however, is the study of this table in the light of higher entrance requirements which have been adopted during the last two or three years by a large number of colleges.⁶ The effects of

these higher requirements are shown in the figures in two ways: smaller enrolments for the colleges which have adopted the higher requirements and larger enrolments for the colleges which have retained the lower requirements. The benefit in larger classes for the "stand pat" colleges can be only temporary, however, so decided is the trend for the higher standards. Already twenty state licensing boards have gone on record for the higher requirements and others are contemplating similar action. The House of Delegates of the American Medical Association in June, 1912, adopted a report instructing the Council on Medical Education to omit from the acceptable list any medical college which after Jan. 1, 1914, does not require for admission in addition to the four-year high-school education, at least one year of higher preliminary work, including courses of college grade in physics, chemistry and biology. The Association of American Medical Colleges has adopted a similar requirement. The medical profession in the United States, therefore, has gone on record for entrance qualifications

TABLE 15.—STATISTICS ACCORDING TO COLLEGE CLASSIFICATION

	Colleges*		Students		Graduates	
	No.	Per Cent.	Number	Per Cent.	Number	Per Cent.
Class A+.....	29	26.9	5,894	35.7	1,218	33.9
Class A.....	39	36.1	6,442	39.0	1,408	39.1
Class B.....	20	18.5	2,333	17.2	686	19.0
Class C.....	20	18.5	1,328	8.1	282	7.0
Totals.....	108	100.0	16,502	100.0	3,594	100.0

* Includes 7 colleges which will hold no more sessions.

which bring medical education in this country more nearly on a par with the requirements of other countries.

RELATIONS WITH BETTER HOSPITALS

Another great wave of improvement, already well begun, is the establishing of closer relationships between hospitals and medical schools, whereby each of the hospitals will have on its attending staff the most skilled physicians who are engaged in teaching and research, and the medical school will possess a teaching hospital in which students may see and study patients at the bedside. This closer relationship is a direct acknowledgment on the part of the hospital that the medical school has improved to such an extent that it is a real honor and a benefit to have a closer relationship with it. This closer relationship undoubtedly means that the hospitals will be conducted along more modern lines since on their attending staffs they will have physicians who are in touch with the latest improved methods of diagnosis and treatment. This relationship means that medical students will be given a better training in the examination and care of patients and that—most important—the public will in future be supplied with better qualified physicians.

5. THE JOURNAL A. M. A., May 23, 1914, page 1640.

6. See lists on page 671.

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SATURDAY, AUGUST 22, 1914

DIETARY TREATMENT AND THE SUGAR CONTENT OF THE BLOOD IN DIABETES

The significance of the sugar-content of the blood in the diagnosis and prognosis of certain disturbances, notably diabetes mellitus, is beginning to be recognized. Data are rapidly accumulating from which it will soon be possible to formulate standards and variations which may be taken as indicative of fairly definite perversions of function. The influence of the ingestion of various kinds of carbohydrates on the level of sugar concentration in the blood has been clearly established, as has the fact that the blood-sugar content of the diabetic departs from the normal both with respect to the existence of a hyperglycemia and in its unlike response to altered alimentary conditions.¹

If there is any aspect of the subject respecting which the records furnished by the new mode of investigation are not yet as complete as might be desired, it is in connection with the influence of the routine dietary treatment of diabetes on the hyperglycemia. Extensive statistics in this field can be obtained only from the larger hospitals and sanatoriums in which suitable patients and adequate laboratory facilities are available. A series of cases studied with reference to some of the features here emphasized has just been reported from the Rudolf Virchow-Krankenhaus in Berlin.² The introduction of a carbohydrate-free regimen consistently produced a decrease in the sugar content of the blood in such cases as were not complicated with chronic nephritis. The extent of the diminution corresponded in general with the severity of the disease. Cases of the mildest type of diabetes were brought to a sugar level characteristic of the normal in perfect health. Moderately severe cases under the same dietary regulations reached a definite level of the blood-sugar which was as a rule higher than the normal, fluctuated with the severity of the symptoms, and was

rather unresponsive to further rigorous treatment. Patients in this class usually reacted to the feeding of carbohydrate more intensely in the direction of increased hyperglycemia than did those exhibiting a less severe diabetes. No variations from these general rules were brought about by such complicating factors as tuberculosis of the lungs, cirrhosis of the liver, or arteriosclerosis.

It is a significant and perhaps unexpected fact that when the lower level of blood-sugar, whatever its figure, characteristic of each case, was once reached, further restrictions in the diet produced no additional lowering of the glycemia. Even after a diminution in the protein intake, as on the days on which green vegetables formed the chief ingredient of the diet, thus approaching a partial starvation level, no reduction of the sugar content was manifested in the blood, although the glycosuria sometimes disappeared at this time. Herein the analysis of the blood reveals a picture not afforded by the examination of the urine alone. It is also worthy of note that on the "oatmeal days," the blood-sugar was, if anything, increased in the cases investigated.

In cases that ended by death in coma the patients showed an increased hyperglycemia, even though they were fasting prior to the examination. In such conditions it seems necessary to assume severe disturbances in intermediary metabolism. The symptoms in nephritic persons were also divergent in some cases. Although in suitable instances the urine frequently became free from sugar after the customary diet restrictions, the sugar-content of the blood was invariably above normal. In some cases, for example, those with contracted kidneys, the hyperglycemia increased even when the glycosuria had permanently disappeared. It is evident, therefore, that such studies on the blood serve as a valuable supplement to other current methods of routine examination. They may furnish evidence of a latent defect of metabolism when it no longer manifests itself by way of more familiar methods.

A RARE ANIMAL PARASITE OF MAN

The extension of medical research into the field of the tropics has brought many novelties and rarities into prominence. One of these is a variety of parasites which infest either man or animals or both. The parasitic invaders of the blood-stream have received most attention, in part because the blood is easily made available for examination. Interest is at present especially centered on the alimentary parasites; and increased necropsies in those countries where the unusual organisms are likely to be revealed have resulted in considerable progress in knowledge. The value of a systematic and thorough study of every branch of parasitology does not consist solely of the possibility of eradicating objectionable causes of dis-

1. The Variation in the Content of Sugar in the Blood, editorial, THE JOURNAL A. M. A., Jan. 10, 1914, p. 131; Adrenal Glycosuria in Man, *ibid.*, March 21, 1914, p. 938.
2. Wolf, L., and G. Mann, S.: In welcher Weise wirken Diätikuren auf das Verhalten des Blutzuckers bei Diabetikern? *Ztschr. f. klin. Med.*, 1914, lxxix, 394.

ease or of relieving the distress produced by some of the undesired invaders of the body. The study of the life-history of even the most uncommon and unimportant of these forms of animal existence may throw light on related harmful species and through the information gained give us more effective means of avoiding or combating parasitic infections. For this reason any advance in the field of parasitology should awaken interest quite aside from the immediate promise of useful application. We sometimes need to recall how few years have elapsed since the suspicion arose of the interrelation of insects and disease.

One of the rarities of tropical medicine, namely, oesophagostomiasis, a disease attributable to a parasitic worm of the genus *Oesophagostoma*, was first described by Brumpt in 1905, in a negro from the Omo River near Lake Randolph, East Africa. According to the very few reports of cases, the malady is characterized by features somewhat akin to hookworm. Hemorrhagic cysts or tumors in the submucosa or muscularis of the large intestine—rarely of the small intestine—usually project both inside and outside of the canal, and contain the immature adult oesophagostoma. At maturity the cyst ruptures and the adult worm escapes into the lumen of the intestine. The ruptured cysts may be invaded by intestinal bacteria, with resultant ulcerations, perforation of the intestine and peritonitis.

Various animals are subject to oesophagostomiasis, but in most of them the infection appears to be due to species of parasites other than that which inhabits man. The worms which are commonly found in the intestines of apes and are known as *Oesophagostoma apistomum* have been regarded by Leiper of the London School of Tropical Medicine as identical with the specimens obtained from African natives and originally named *Oesophagostoma brumpti*. The study of the development of the forms found in the monkey has therefore been begun in the Bureau of Science at Manila.¹ The ova can be recovered from the feces, and their development takes place in cultures made in the same manner as for the ova of the hookworm. The larva grows rapidly, and under favorable conditions of culture and temperature attains its maturity in from three to four days. In the process of growth it molts twice. At the last molt the skin is not shed, but remains as a sheath enclosing the larva. In this matured form differing in size and shape from the mature larva of the hookworms and strongyloides, it is ready to infect a new host. Walker points out that this development is strikingly similar and wholly comparable with that of *Ankylostoma duodenale*, which is perhaps to be expected from the somewhat near relationship of the two worms. From this similarity one might expect by analogy that the method

of entrance of the larva into the body of the host would also be similar. The question as to the way in which it attains its position in the tissues of the large intestine can now be solved experimentally, owing to these successful preliminary studies in government laboratories in the Philippines.

ABUSE OF SPECIAL PRIVILEGE

Many of the prominent newspapers of the country have recently been sent printed copies of a committee document from the United States Senate which was printed for the use of the Committee on Public Health and National Quarantine of the second session of the Sixty-Third Congress. Its title is "Arsenization Method of Preventing Yellow Fever," and it is "a memorial praying that publicity be given by the government to the arsenization method of preventing yellow fever as practically demonstrated in the epidemic at New Orleans, Louisiana, 1905." While the matter has merely been referred to the Committee on Public Health and National Quarantine, and the committee has not yet reached any decision in the matter, the first page bears the words "printed for the use of the committee," and the distribution of these committee documents to the newspapers is actually a definite endeavor to secure through the government printing office the publicity prayed for while the matter is before the committee and without waiting for its decision in the matter.

For the proper information of the newspapers it seems to us unfortunate, or at least lacking in that courtesy that publicity seekers should cultivate, that Senate Document No. 111, printed for the second session of the Fifty-Fifth Congress and dated February, 1898, just sixteen years to the month before the subsequent document, was not submitted at the same time to the editorial writers. The title of this is "Arsenization Method of Treating Cholera." The previous memorial also was referred to the Committee on Public Health and National Quarantine in order to be printed. It contained a similar request from the author of the present appeal praying that a test be made of the arsenization method of treating the disease of cholera. The earlier pamphlet is the best possible commentary on the later document which newspapers are now requested to comment on.

Proverbially the hardest thing in the world in logical reasoning is to prove a negative. An immense amount of observation would have to be made in order to demonstrate that the taking of arsenic in certain quantities prevented the development of a specific infectious disease. That it should prevent two such very different specific infections as cholera and yellow fever raises the difficulty of the solution of the problem almost to what mathematicians would call the nth degree. There are almost necessarily millions of people, always hundreds of thousands, in any country

1. Walker, E. L.: The Life History of *Oesophagostomum Apiostomum*: I. Development Outside of the Host, *Philippine Jour. Sc., Trop. Med. (B)*, 1913, viii, 501.

in which such an infection is epidemic, who do not come down with the disease that affects so many of those around them. This has always been true. Their vitality renders them capable of immunizing themselves against the infection. Any of the manifold substances, food materials or drugs that they have been taking might be asserted to be the origin of their immunity. Only the most careful differential investigation under very favorable circumstances for the elimination of disturbing factors would lead to a definite conclusion of any value under such circumstances.

It is interesting to read the account furnished in the latest Senate committee document of the large number of persons who on the bare possibility that arsenic, though in itself a seriously poisonous drug, might help in protecting them from yellow fever, took it in considerable quantities during the epidemic in New Orleans in 1905. The prescription to "take one-one-hundredth of a grain of arsenious acid three times a day for the first week of exposure to infection, twice a day the second week, and once daily thereafter until the remainder of one hundred tablets [why one hundred, except that it is a nice round number, is not clear], granules or powders are taken, or until the epidemic is closed by virtue of sanitary or hygienic precautions or weather conditions" was widely published in the newspapers of the South and "was taken up by the populace of the threatened city in a truly astonishing manner." There was an almost unprecedented rush for the new prophylactic. "Jobbers and wholesalers soon ordered in lots of a million, until upon investigation by representatives of well-known publishing houses it was learned that between fifteen and twenty millions of this particular tablet had been supplied to the trade of New Orleans within the preceding twenty-three days, with many more millions to the trade of outlying infected districts."

Indeed, the only parallel in medical history that we know to such an enormous consumption of a drug is the marvelous spread of the use of tobacco, especially chewing tobacco, when the weed was first introduced. Tobacco was declared to be a wonderful tonic strengthener of the system, a marvelous discovery of the Indians, who by it secured long life and freedom from disease, and above all it was declared to be the most potent of prophylactics. The tradition that was created was so strong that there are still some remnants of it left in the folklore and the popular medicine of all nations. Many a person is still persuaded that to take a chew of tobacco before approaching a small-pox patient or sufferer from other malignant disease is a protective. Undertakers and their helpers still pass on the tradition, in country places at least. In spite of kings and government authorities then and the general condemnation of the learned with even the outspoken disapproval of the church, the use of tobacco spread. That was in the seventeenth century, and we some-

times think that we have progressed beyond the rather childish state of mind which we are inclined to attribute to that period. Incidents like the present raise the question whether or not we have progressed.

In the meantime, the sending of these copies of a document printed at government expense for the use of the Senate committee to the newspapers of the country is an abuse of privilege that deserves severe condemnation. The Committee on Public Health and National Quarantine surely is not willing to allow its privileges to be thus abused, and cannot permit itself to be made a party to this method of securing publicity for a remedy whose efficiency is eminently doubtful and interest in which might well serve to obscure the significance of the true method of preventing yellow fever by eliminating the mosquito, which has been demonstrated to be so effective.

CHOICE OF A MEDICAL SCHOOL

Never before has the choice of a medical school been so simple and easy as at the present time, owing to the abundance of information which is available for the student's guidance. And never was it so important that a careful and wise choice be made.

Formerly the training secured in any medical college was sufficient to give the physician a start in his life work, and to secure a license to practice was also a simple matter. Not so at the present time. Modern medicine is based on scientific knowledge, and without this knowledge the physician of the future will be a failure. To secure such knowledge the student must have a better preliminary education than formerly, and must secure his medical education in a college which has a corps of expert, salaried teachers, well-equipped laboratories and an abundance of dispensary and hospital facilities. Now also definite qualifications are demanded by the various states before the license to practice can be secured.

Before choosing a medical school the student should acquaint himself with the requirements of preliminary and medical education held by the various state licensing boards. These standards have recently been advanced in several states and are bound to be advanced in others in the early future. At present seven states¹ require as the minimum standard of preliminary education two years of liberal arts' college work in addition to a four-year high-school education. In thirteen other states² the minimum standard is one year of collegiate work, in addition to the high-school education. If, therefore, a student is intending to practice in one of these twenty states, it will be necessary for him to have the required amount of preliminary education. If the student needs additional preliminary training, the time to acquire it, of course, is

1. Alabama, Colorado, Indiana, Iowa, Minnesota, North Dakota and South Dakota.

2. Arkansas, California, Connecticut, Kansas, Kentucky, Illinois, Michigan, New Hampshire, Pennsylvania, Rhode Island, Utah, Vermont and Virginia.

before he begins the study of medicine. In fact, this higher preliminary education is now required by all of the better medical colleges. More important, however, a good preliminary education is essential in order that the student may be enabled to master the more complex problems of the modern medical course.

Another very important matter for the student to consider is the character of the college itself. State licensing boards are now making more common use of their legal power to discriminate between medical colleges and to refuse recognition to those which are deemed not properly qualified to furnish a training in modern medicine. Diplomas from those not recognized do not constitute acceptable qualifications for the license to practice medicine in such states. It is important for the student to make sure not only that he has the adequate preliminary education, but also that he shall obtain his training in a medical college which is given recognition in all states.

The question is: How may the student secure the information needed on these matters? Some medical colleges advertise extensively in the newspapers and in popular magazines, and send out announcements and circulars containing very glowing, if not misleading statements. At present several medical schools are being thus extensively advertised, even though their diplomas are not recognized in from twenty-five to thirty states! It is hardly to be expected that the announcements sent out by these schools will convey the information which the prospective students need. It is essential, therefore, that before choosing a medical school, he should secure further information from impartial and reliable sources, so that he may be sure that he is not enticed into a poorly equipped institution and find on graduation that his diploma is not recognized in a large number of states.

An important matter which the student is always bound to consider is the expense. But it is well for him to know that to enter a low-grade medical college because the fees may be a little lower is very poor economy. The truth is that in the same length of time, and often for even lower fees than he would pay in the poorly equipped institutions, he may acquire his education in one of the best-equipped medical schools in the land. This refers particularly to the medical departments of state universities. On the other hand, he should know that even if some of the better schools do charge higher fees, nevertheless, they spend on each student, per year, several times the amount of money that the student pays in tuition. Here again, it would be poor economy to enter a low-standard college which depends on students' fees alone for its income, when for a few additional dollars each year he can enter a thoroughly equipped institution and get a far better medical training. Even should he be required to work his way through college, in whole or in part, the opportunities for doing so are, as a rule, greater in the better than in the lower standard col-

leges. Generally, however, worthy students who are poor in purse are the very ones who appreciate not only the value of money but also the value of the medical course they are getting. Such students are seldom beguiled into a poor college by alluring and misleading advertisements.

In order that the student may be thoroughly informed in any and all of the foregoing matters it would be well for him not only to secure the announcements of a number of colleges among which he may be able to choose, but also to secure reliable information from other sources. He should read carefully the reports on medical colleges published from time to time in *THE JOURNAL* by the Council on Medical Education, which can be obtained in reprint form. After an extensive investigation, including several inspections, the various medical schools have been rated by the Council in four classes, namely, A+, A, B and C, depending on their excellence. If the student is otherwise in doubt, he will not make a mistake by choosing one of the colleges contained in the higher classification. If he has had two or more years of collegiate work in addition to a four-year high-school education, and if he earns his diploma at a college in the higher classification, there is no doubt regarding either the quality of the training obtained or his eligibility after graduation to obtain a license in any state of his choice.

The student must bear in mind that in his preliminary and medical training he is laying the foundation for the rest of his life. If a year or two more is needed to enter one of the better medical colleges, he may count it as time well spent, since he is all the more sure of having laid a solid foundation. The medical profession in this country is extremely overcrowded, but there is always room for physicians who are thoroughly competent. The opposite must not be forgotten: disappointed, indeed, will be that student who, because of alluring advertisements or because of lower entrance requirements, is induced to get his training in a poorly equipped college, and who finds after graduation that he is handicapped for life.

Current Comment

FEWER MEDICAL COLLEGES, STUDENTS AND GRADUATES

The statistics published this week show that in the last decade there has been a marked decrease (about 35 per cent.) in the number of medical colleges and corresponding reductions in the number of students and graduates. Of colleges the decrease was from 165 to 101; of students the decrease was from 28,142 to 16,502 and the number of graduates decreased from 5,747 to 3,594. There are some perhaps, who, not knowing the real cause, may look on these marked reductions with alarm and believe that this country will soon be suffering from a dearth of physicians. Alarming statements to that effect are already being

circulated, but invariably these statements come from those interested in medical colleges conducted more as business enterprises than as educational institutions; those who look more to the incomes from students' fees than to the quality of physicians turned out. There would not have been the marked reductions referred to had it not been for the vast oversupply of medical colleges existing in this country ten years ago. That there is room for a still greater reduction of medical colleges; that there is no cause for alarm regarding a scarcity of physicians, and that the reductions referred to are distinctly in the interests of the public, are clearly evident to any one acquainted with the facts.

REDUCING AN OVERSUPPLY

Prior to the Civil War there had been a rapid increase in the number of medical colleges, there being at the time about sixty in this country. Following the war, however, the number increased by leaps and bounds, until in 1906, not counting the out-and-out diploma mills, a maximum number of 162 colleges was reached. It was then discovered that this country alone had more medical colleges than all other countries of the world combined! The conditions were preposterous. Although an unusual but real demand for doctors, caused by the rapid development and growth of the country, was what originally led to the formation of proprietary medical colleges, nevertheless, not only was the demand soon supplied, but also there came to be so vast an oversupply as to be actually ridiculous. And such colleges! Although there were some fairly good ones, a very large per cent. were joint stock corporations, conducted solely for profit. They were devoid of equipment, few held seriously to any entrance standard, and whoever could pay the tuition fees—the only requirement—was admitted. In order to swell the number of students, and incidentally the income from fees, glowing advertisements were printed and salaried solicitors were sent to offices, work-shops and farms. Large classes were turned out each year after only two short sessions! Is it a wonder that there has been a marked decrease following the quiet but careful investigation of the Council on Medical Education? There is certainly no question that the great reduction in the number of medical colleges and the remarkable improvement in the quality of those remaining will result in a greatly improved medical profession and—more important—will insure for the people better qualified physicians.

NO DANGER OF A SCARCITY OF PHYSICIANS

That the marked reduction in the number of medical colleges during the last decade will result in a dearth of physicians in this country is a proposition which appears ridiculous to any one acquainted with the facts. The normal proportion of physicians to population in the leading nations of Europe is one to every 1,500 to 2,500 people; this country has one physician to every 600 to 850 people. The figures given for this country do not include the osteopaths, Eddyites and other so-called drugless practitioners, which

are scarcely found in other countries. The annual loss of physicians from deaths in this country is approximately 2,000, while the annual output of physicians from the medical colleges for several years exceeded five thousand. Even this year there were 3,594 or nearly twice as many physicians added to the profession as are lost from deaths. It is evident, therefore, that if the annual number of graduates merely replaced the number of physicians removed by death it would still require many years before the supply of physicians would be reduced to the normal quantity needed. Just so long as the colleges continue to turn out more than the number removed by death, just so much longer will it be before the normal proportion is reached. Again, it is apparent that the sixty better medical colleges with their present equipment, and with little if any added expense, could easily take care of all the students at present enrolled in the 101. It is quite clear, therefore, that the number of colleges might be reduced by another fifty per cent. and there would still be no danger of a doctor famine. Thus far we have considered mere numbers. When we consider also the better trained physicians who are now being turned out in place of the product of former years, the danger of a lack of adequate medical service will be pushed still further away. The situation is simply this: A ridiculously large oversupply of exceedingly low-grade, commercial medical colleges with their enormous output of poorly educated doctors is rapidly giving way to a normal quantity—not reached yet—of high-standard educational institutions which are annually turning out a still comparatively large number of more thoroughly trained physicians. There is no question that the change is most beneficial to the public however one may look at it.

MEETING THE SHORTAGE OF IMPORTED DRUGS

Last week we commented¹ on the possible effect of the European crisis on our drug supply, especially the impending shortage of proprietary products (patented or trademarked) of foreign manufacture. As one of the first effects of this shortage physicians will learn that a large number of foreign products sold under proprietary names are available in this country under their non-proprietary, descriptive names if they will prescribe them. Among these may be mentioned dionin, which is offered by American manufacturers as ethyl-morphin hydrochlorid and to be included in the Pharmacopeia under this term; urotropin, which has long been available as hexamethylenamin; and diuretin, available as theobromin sodium salicylate. Atophan is not protected by patent and it is to be hoped that some enterprising American firm will very promptly undertake the manufacture of this product and that American physicians will just as promptly learn to prescribe it under a modified chemical name such as phenyl-quin or any other which may be officially adopted. As regards patented products which are the property of particular foreign firms: It should be demanded of such firms that they take prompt steps to secure the manufacture of these products in this

1. THE JOURNAL, August 15, p. 586.

country as has been done for some years, we are informed, in the case of acetylsalicylic acid (aspirin). If these firms are not in a position to establish factories of their own they will find little difficulty in securing the manufacture of their products by competent American firms. In the meantime Congress should revise the patent law to make it agree with that of most foreign countries; that is, the holder of a patent must under penalty of forfeiture begin manufacture of the patented product in this country in a reasonable period of time after the issuance of the patent. At the same time Congress might properly consider the feasibility of revoking foreign patents on medicinal products if their owners fail to take proper steps to secure for us a supply of the product by manufacture in this country if necessary.

PATENTS ON CERTAIN CHEMICALS EXPIRING

In connection with the shortage of foreign drugs, on which we comment elsewhere, it may be worth while to note that the patent rights on a number of familiar patented products have expired or are about to expire; for instance, the patents on euquinine, pyramidon and protargol have lapsed; those on orthoform-New and aristochin will expire in 1915 and 1916, respectively. Since these products will be public property after the dates indicated, American firms should lose no time in undertaking their manufacture. It should be remembered, however, that if substitutes are to be allowed, standardization should be demanded. Inferior substitutes are a menace greater than the lack of the original products. If salvarsan, neosalvarsan, protargol, etc., are to be made in America, our government should see to it that the American output equals the European product.

Medical News

ILLINOIS

New Officers.—Stark County Medical Association at Toulon, July 27: president, Dr. James R. Holgate, Wyoming; secretary-treasurer, Dr. Clyde Berfield, Toulon.

Illinois Physicians Abroad.—Dr. and Mrs. Harry E. Kerch, Dundee; Dr. James J. Moran, Spring Valley; Dr. Augustus W. Chandler, Rochelle, and Dr. William L. Gray, Champaign, are held in London on account of war conditions.—Dr. and Mrs. William R. Parkes, Evanston, returned from Europe, August 7.

Farm Cottage Annex.—The Illinois Board of Administration has decided to open a farm cottage annex to the Kankakee State Hospital on the site of the new Alton State Hospital. Three farm houses on this property are available, which will accommodate about one hundred patients who have almost recovered their mental poise.

Kane County Board Takes No Action.—Supervisor George F. Sills of Kane County calls attention to an error in THE JOURNAL of August 8, page 491. The committee of supervisors, as then stated, have prepared a report opposing the establishment of a county sanatorium, but no action has been taken on this report as there will be no meeting of the board until September.

Chicago

Personal.—Dr. John P. Sprague has been appointed professor of physical education and hygiene at Grinnell College, Grinnell, Iowa.—Dr. Otto L. Schmidt has been elected commodore of the Northwestern Yachting Association and of the Inland Lakes Yachting Association.

Home from Abroad.—The following physicians of Chicago have recently returned from abroad: Dr. and Mrs. Harry J. Stewart, Dr. Casey A. Wood, Dr. and Mrs. Junius C. Hoag, Dr. Wilhelm E. Krieger, Dr. Raymond W. McNealy, Dr. and Mrs. Edward L. Webb and Dr. Jabez D. Hammond.

Physicians Still Detained Abroad.—The following additional names of physicians detained abroad on account of the difficulty of obtaining passage by reason of war conditions are: Dr. and Mrs. Peter C. Schenkelberger, Dr. Paul Owsley, Dr. and Mrs. Alfred Schirmer and daughter, Dr. Ernest A. Loewinger, Dr. Robert H. Buck and Dr. Michael Goldenburg.

Cook County Hospital Opened.—The first building of the new Cook County hospital was opened August 15 without ceremony. The building at present in use is the administration hall which will accommodate 656 patients. The entire eighth floor of the building is arranged for surgical work. There are nine operation rooms including two amphitheaters. The silent-call signal system has been installed throughout the institution. The old hospital buildings are now to be wrecked to make room for the new structures which will cost when completed, \$16,000,000.

KENTUCKY

State Association Meeting.—The annual meeting of the Kentucky State Medical Association will be held at Newport, September 24-26, with headquarters at the Carnegie Hall.

Personal.—Dr. Arthur L. Nelson has succeeded Dr. Evan E. Owen as secretary and assistant superintendent of the Louisville City Hospital.—Dr. David C. Morton, Louisville, professor of medicine in the University of Louisville and chairman of the City Hospital Committee, has resigned and retired from practice.

Pellagra Conference.—A pellagra conference was held by the State Board of Health in connection with the annual school of city and county health officers at Pineville, August 18 to 20. In addition to the study of pellagra there was an unusual clinic, and the duties of physicians and health officers under the new law in regard to trachoma and other diseases leading to blindness were fully discussed and explained. Special attention was also given to the study of the sanitation of small towns and country districts with a view to the prevention of typhoid fever.

MASSACHUSETTS

Insanity Board Organized.—The new Board of Insanity created under the law relative to the organization and powers of the State Board of Insanity, which went into effect August 1, was organized August 10, with Dr. Michael J. O'Meara, Worcester, president; Dr. L. Vernon Briggs, Boston, executive secretary, and M. Charles E. Ward, Buckland, as the third member. The appointments were made by the governor early in August.

Personal.—Dr. Milo A. Jewett has been appointed United States consul at Kiel, Germany.—Dr. Max Baff, Worcester, has returned from abroad.—Drs. Henry M. Chase and Hilbert F. Day have been appointed surgeons in charge of the Boston Dispensary to fill the vacancies caused by the retirement of Drs. Benjamin Tenney and John Homans, who have been placed on the consulting staff of the institution.—Dr. Simon F. Cox, superintendent of the Tuberculosis Hospital, Mattapan, since 1906, has accepted the position of superintendent of the New Haven hospitals.—Dr. Walter Channing, Brookline, a trustee of the Boston State Hospital, has resigned.

MICHIGAN

Hospital Merger.—Solvay General Hospital, Detroit, with a capacity of fifty beds was merged with the Harper Hospital, August 3. The merged institutions will be under the care of Dr. Wayne Smith, superintendent of the Harper Hospital.

Personal.—Dr. F. Elizabeth Barrett has succeeded Dr. Claude B. Fulkerson as medical inspector of the public schools of Kalamazoo.—Dr. Duncan McKellar, Hillsdale, who has been suffering eight weeks from septicemia, had his right leg amputated recently.

Veteran Honored.—Dr. Theodore A. McGraw, Detroit, in recognition of forty-five years of continuous service as a member of the medical board of St. Mary's Hospital, was honored June 30 by fifty of his associates who presented him with a silver vase as a token of love and appreciation from his co-workers in the hospital.

Michigan Physicians Abroad.—Drs. Ross U. Adams, Kalamazoo, and Francis H. Callow, Mt. Morris, have returned from Europe.—Dr. William F. Hake, Grand Rapids, is reported to have sailed from Europe August 6.—The following Michigan physicians are believed to be held in London by reason of the war situation: Drs. Charles H. Oakman, Angus McLean, James M. Robb, Roland E. Loucks, Ernest W. Haass, Max Ballin, George E. McKean, Don M. Campbell, Alexander W. Blain and J. Everett King, Detroit, and Drs. Charles E. Boys, Kalamazoo, Charles H. Baker, Bay City and Arthur L. Robinson, Allegan.

MINNESOTA

Medical Block Again Burned.—The third fire in four months in the Medical Block, Minneapolis, August 7, did damage amounting to \$35,000.

New Officers.—Wabasha County Medical Society at Elgin, July 9: president, Dr. William B. Heagerty, Mazeppa, secretary-treasurer, Dr. William F. Wilson, Lake City.

Minnesota Physicians Abroad.—Dr. William R. Murray, Minneapolis, and Dr. Charles H. Mayo, Rochester, have returned from Europe.—Dr. Charles W. More, Eveleth, Louis A. Fritsche, New Ulm, Frank C. Davis, Minneapolis, and Rowland Gilmore, Bemidji, are believed to be detained in Europe on account of the war conditions.

Personal.—Dr. Ernest A. Anderson, Holdingford, has been elected a member of the board of supreme medical directors of the Modern Woodmen of America with his office at Rock Island, Ill.—Dr. H. G. Lampson has resigned as health officer of Rochester.—Dr. G. W. Moore has been elected mayor of Hopkins.—Dr. Rollo C. Dugan, Winona, has been appointed superintendent and chief surgeon of the hospital recently established in Ottawa, Kans., by the Businessmen's Association of that city. The hospital is located in the old Semple Sanitarium building.

NEW YORK

Sanitary Conference.—The annual sanitary conference of the State will be held in Saragota, September 15 to 17. In addition to the meeting of health officers there will be a sectional conference for registrars of vital statistics.

To Bar Useless Germicides.—A bill is being prepared by Senator William J. Heffernan of Brooklyn for introduction at the next session of the legislature to stop the sale of useless disinfectants. It is claimed that about 25 per cent. of the disinfectants now used are worthless. Maryland is the only state thus far having a law dealing with the sale of disinfectants.

New York City

Fewer Deaths Among Infants.—During the first week in August the total number of deaths among infants under one year of age was 331, or fifty less than during the corresponding period of 1913. Manhattan led in the decrease with 167 deaths as against 198 for the corresponding week of last year.

Brooklyn Hospital Purchases Site.—The Williamsburg Hospital, which has been located on Bedford Avenue for half a century has purchased a site for a new hospital at South Ninth Street and Driggs Avenue. It is intended to erect a modern hospital building early next year which it is expected will cost \$125,000.

Personal.—Dr. Alexis V. Carrel of the Rockefeller Institute of Medical Research, who has been visiting his home at Lyons, France, has gone to the front as a surgeon with the French army.—Dr. Moses Kahn has resigned from the resident staff of Sea View Hospital to accept the position of assistant physician in charge of tuberculous cases at the Eloise Infirmary, Eloise, Mich.

High Cost of Food and School Children.—Dr. Sigismund S. Goldwater, Health Commissioner, announces that he proposes to make an investigation of the effect of the increased cost of food on the health of school children. The nurses who visit the school are to make a general examination in September and to make inquiries into the cause of lack of proper nourishment. The information presented will be submitted to the Mayor's Committee.

PENNSYLVANIA

Personal.—Dr. Mary M. Wolfe, Lewisburg, has been appointed superintendent of the State Institution for the Care of Feeble-Minded Women, near Hartleton.

Detained in Europe.—Drs. Oskär Klotz and James D. Heard, Pittsburgh, and Martin E. Griffith, Monessen, are detained in Europe on account of the prevalent war conditions.

Philadelphia

Personal.—Dr. McCluney Radcliffe received the degree of LL.D. from Pennsylvania College, Gettysburg, in June.—Dr. J. E. B. Buckenham was provisionally appointed as acting chief resident physician at the Philadelphia Hospital for Contagious Diseases, during the absence of Dr. S. S. Woody, on vacation.

Changes at Polyclinic Hospital.—At the last meeting of the board of managers, Dr. Thomas B. Holloway was elected professor of ophthalmology to succeed Dr. James Thorington, resigned; Dr. Charles R. Heed was elected associate professor of ophthalmology; Dr. George S. Crampton was made lecturer on refraction.

Raid on Doctored Drinks.—A determined crusade, supported by the Phipps Institute, where several children are seriously ill from saccharine poisoning, and the child federation, resulted in the arrest, August 13, of twenty-eight persons in the downtown section of the city. Fourteen of them admitted their guilt and were fined \$28 to \$32 by Magistrate Rooney. Seven cases were continued and seven other violators of the pure food law paid the costs and signed the agreements to quit the business.

Crusade Against Rats.—As several deaths from bubonic plague have occurred in Liverpool, precautions are being taken at this port to prevent an introduction of the disease. Dr. Fairfax Erwin, in charge of the United States Marine Hospital here and Dr. Henry D. Heller of the State Quarantine Board, asked the cooperation of the Health Department to begin a war on rats which infest the river front. Following a conference of Chairman Connelly of councils finance committee and City Controller Walton, August 14, it was announced that \$10,000 would be placed at the disposal of Director Harte of the Bureau of Health and Charities for this purpose.

TENNESSEE

New Officers.—Sullivan, Carter and Johnson Counties Medical Society, organized at Johnson City, July 23: president, Dr. Edward S. King, Bluff City, Sullivan County; vice-presidents, Drs. Edwin E. Hunter, Elizabethton, and David R. Butler; secretary, Dr. Conley M. Cowan, Bristol. The next meeting will be held at Bluntville.—State Association of Colored Physicians at Dickson: president, Dr. F. A. Stewart, Nashville; secretary, Dr. Isham H. Hampton, Fayetteville. The next meeting will be held in Nashville.

Personal.—Dr. William D. Haggard, Nashville, returned from Europe on the *Mauretania*.—Dr. Reynold M. Kirby-Smith, Sewanee, has been selected by the American National Red Cross to direct the relief work in one of the belligerent countries of Europe.—Dr. Walter Stewart, Bolivar, has been appointed superintendent for the West Tennessee Hospital for the Insane, succeeding Dr. James J. Neely, resigned. Dr. Edwin W. Cocke, Whiteville, has been appointed assistant superintendent.—Drs. John S. B. Woolford and Henry Berlin, Chattanooga, have been detained in London on account of war conditions.—Dr. James W. Gillespie, for fourteen years coroner of Hamilton County, has resigned and Dr. John J. Gee has been elected his successor.—Dr. Otis M. Hayward, proprietor and president of the Chattanooga Hospital, has accepted the presidency of the Hurlbut Sanitarium and Industrial School, Reeves, Ga.—Dr. Z. D. Massey, physician at the State Prison, has resigned and will resume practice at his old home in Sevierville.

TEXAS

New Officers.—Dallas Medical and Surgical Society, July 25: president, Dr. Oscar M. Marchman; secretary, Dr. Franklin A. Pierce.

Fund for Medical College.—A fund of \$40,000 was subscribed for the medical department of the Texas Christian University, Fort Worth, July 23.

Dinner to Surgeon General.—In honor of Surgeon General Rupert Blue, U.S.P.H.S., the Sisters of the Incarnate Word, Galveston, gave a dinner July 13.

Tuberculous Convicts Pardoned.—Thirty convicts in the Texas State Penitentiary in an advanced stage of tuberculosis, have been pardoned by the governor.

Emergency Hospital Provided.—The United States Quarantine Station, Pelican Island, is being fitted up as a possible Emergency Hospital for contagious diseases with especial reference to bubonic plague.

Dr. Osborne not Dead.—Dr. Frank Ely Osborne, McAllen, Texas, states that the notice of his death which appeared in THE JOURNAL of August 15, is incorrect; that another person of the same name was in the automobile accident.

Work on Epileptic Colony to Begin.—Plans for the first of the two new buildings for the Epileptic Colony which will be established south of Abilene, have been received and construction work has been commenced. The buildings are to be two stories and basement in height and will be located on the southwest corner of the colony grounds.

Sanitarium News.—An addition to the Texas Baptist Memorial Sanitarium, Dallas, has been erected at a cost of \$30,000. The building is to be used for negroes, Mexicans and indigent white patients.—The sanitarium at Sutherland Springs which is being erected at a cost of \$10,000 is almost completed.—A cottage for consumptives has been erected at the North Texas Hospital for the Insane, Terrell.—Plans are being prepared for an addition to the St. Paul Sanitarium, Dallas.

Personal.—Drs. Hugh W. Crouse, El Paso and Robert S. Killough, Amarillo, have been detained in Germany on account of the war.—Dr. Henry A. Barr, Beaumont, has returned from abroad.—Dr. Bacon Saunders, Chief Surgeon of the Trinity and Brazos Valley Railway and Dr. Roy Saunders, Assistant Chief Surgeon, Ft. Worth, have resigned. Dr. A. Philo Howard, Houston, has been appointed Chief Surgeon for the Road.—Dr. Thomas J. Milner, Greenville, has been appointed medical director with the rank of Major in the Third Brigade Texas Division, United Confederate Veterans.—Dr. Paul Renger has resigned as health officer of Hallettsville to accept the position of health officer of Lavaca County.—Dr. Charles H. Brownlee, Austin, has resigned as field director of the Texas Hookworm Commission and will reenter practice at his old home in Burnett.

GENERAL

Hospital Experts to Meet.—The annual conference of the American Hospital Association will be held in St. Paul, August 25-28, with headquarters at the Hotel St. Paul.

Electro-Therapeutists to Meet.—The annual meeting of the American Electro-Therapeutic Association will be held in Battle Creek, Mich., September 15 to 17, under the presidency of Dr. George E. Pfahler, Philadelphia.

Anesthetists Elect Officers.—At the annual meeting of the American Association of Anesthetists held in Atlantic City recently, the following officers were elected: Dr. Charles K. Teter, Cleveland, president, and Drs. Mary V. Madigan, Portland, Ore., W. D. Galch, Indianapolis, and T. B. Buchanan, New York City, vice-presidents.

Fraternal Order's Work Against Tuberculosis.—The Loyal Order of Moose at its convention in Milwaukee, which closed July 31, decided to withdraw the appropriation of \$125,000 which had been given annually to the official publication, "The Call of the Moose," and to use the money for the establishment and maintenance of a sanatorium for its members suffering from tuberculosis.

Retired Naval Surgeons Abroad.—The following retired officers of the medical corps of the United States Navy are reported to be abroad: Med. Dir. John C. Wise at Bordeaux, Surgeon General William K. Van Ruyphen, Med. Dir. Henry G. Beyer, Dwight Dickman, David Kindleberger and Averly C. H. Russell, Passed Assistant Surgeon Paul E. McDonnold and Assistant Surgeon Arthur C. Stanley, in London.

Bequests and Donations.—The following bequests and donations have recently been reported:

Methodist Hospital, Philadelphia, \$5,000 by the will of Miss Hessa R. Miller for the maintenance of a free bed.

The Philadelphia Home for Incurables, \$15,000 by the will of Mary J. Van Syckel, for the maintenance of two free beds.

German and St. Mary's Hospital, Philadelphia, an equal donation of the property owned by the late Mrs. L. Gluck at Twenty-fourth and Stanley Streets.

Post-Graduate Hospital, New York City, \$5,000 by the will of Miss Cora V. C. Catlin in memory of her brother John M. Catlin.

Dr. Gerald R. Maloney, Belleplaine, Minn., property valued at \$400,000 by the will of Monsignor Thomas Kennedy.

Old Peoples' Home, Omaha, Neb., a donation of \$5,000 toward an endowment fund in memory of Mrs. Ida V. Tilden, Oswego, N. Y., City Hospital, \$10,000; New York Association for Improving the Condition

of the Poor and St. Luke's Hospital, New York City, each \$25,000 by the will of George E. Sloan of Oswego.

American National Red Cross, Colorado Chapter, donation of \$1,000 by Lawrence C. Phipps, Denver.

The Plague Situation.—The last case of human plague reported from New Orleans was that of Rosie Southern, reported July 22 and officially diagnosed July 26. Four more cases of plague have been diagnosed since that time and the particulars of these are given below, together with the cases of rodent plague and the details of the work which is being so actively conducted in New Orleans by Assistant Surgeon-General William Colby Rucker, U.S.P.H.S., and his efficient staff with the intelligent and active cooperation of the health authorities of the state of Louisiana and the city of New Orleans. Case No. 14, Henry Chase, male, colored, 22, residing 2136 Eighth Street, car cleaner, working in the L. & N. shops, Girod and Front streets. Sickened July 29, 1914. Right femoral bubo. Officially declared plague Aug. 2, 1914. Case No. 15, Mrs. J. Bua, female, white, 20, residing 1836 Iberville Street, and working at the same address in a grocery. Sickened Aug. 11, 1914. Left femoral bubo. Officially declared plague Aug. 12, 1914. Case No. 16, Anthony Gergurovich, white, male, residence 1817 Carondelet Walk, employed at French market, sickened August 8, left inguinal bubo, diagnosis confirmed August 13. Case No. 17, Herman Schulz, white, male, age 17, residence 1836 Iberville Street, employed at same address, sickened August 1, diagnosis confirmed August 13, right femoral bubo. Cases 15 to 54 of rodent plague have been reported up to August 15. The infected rats were found in the same general localities as heretofore. From the beginning of the work on July 9, 1914, up to and including Aug. 12, 1914, there were captured in traps 42,214 rats, and in the same period a conservative estimate of the number of rats destroyed by the antiplague workers is 60,000. The campaign of publicity and education has been carried forward very vigorously. Three and four public addresses have been made each day, many of them illustrated by means of stereopticon views. As a result, there has been formed an organization in each of the seventeen wards of the city, each of which has established a precinct captain, under whom are monitors for each block. The commissioner of public property, the Honorable E. E. Lafaye, with Assistant Surgeon-General W. C. Rucker, has formed committees for the conduct of clean-up days in the various wards. Several wards have already been treated, and the work will be extended throughout the entire city. Public cooperation has been very extensive, and thousands of yards of concrete and other rat-proofing material are being laid throughout the city, and the city is rapidly becoming more sanitary. Advantage has been taken of the billboards of the city to extend the publicity campaign. There is one large night and day sign 30 feet long by 12 feet high located on Canal Street, and there are distributed throughout the city 400 posters, 42 inches by 84 inches, calling on the citizens to unite in the sanitary campaign. The inspection of outgoing freight has been extended, and there are now employed in this work one chief inspector and eighty-two assistant inspectors. The citizens' committee, which was appointed by Mayor Behrman, was reorganized on August 6 as the Citizens' Health Committee, with Mr. Crawford Ellis as chairman. This committee consists of the original fifteen members appointed by the mayor and seventeen members representing the various wards of the city; a special committee on sanitation, of which Dr. H. Dickson Bruns is chairman; a committee from the New Orleans Parish Medical Society, of which Dr. Jos. Scott is chairman; a committee from the Pan-American Medical Society, of which Dr. Hochfeldt is chairman; the state health officer, the city health officer and the officer in command of the United States Public Health Service are also members of this committee. The committee meets each Thursday for the purpose of considering cooperative work of the campaign. It is anticipated that the women's clubs of the city will be given a representative on the Citizens' Health Committee. During the fortnight ended August 8, 219 vessels were fumigated; 21,827 pounds of sulphur were burned; 172,917 tons of outgoing freight were inspected; 45 clean bills of health and 10 foul bills of health were issued. The overland freight inspection during the same period included 9,888 cars; the rat-proofing of 3,272 cars; the condemnation of 18 cars and the killing of 13 rodents in cars. In the field operations 19,405 rats were trapped, 227 dead were inspected; 18 buildings were fumigated; 33,910 poisons were placed, and 3,926 buildings were inspected. In the laboratory 18,670 rats were examined out

of 20,752 received; of these 61 were suspicious and the diagnosis of plague was confirmed in 29. The following circular letter regarding shipment of merchandise was issued August 4:

To Shippers, Agents and Others Concerned, City of New Orleans, La. For your guidance, and in order to prevent unnecessary hindrance to commerce, you are informed that, in compliance with United States Statutes At Large, Vol. 27, page 449, Act of February 15, 1893, no merchandise shall be permitted shipment from New Orleans, except it be so protected as to exclude rats.

This applies especially to merchandise in crates, barrels, hampers or boxes, and packed with excelsior, straw, paper or burlap.

Containers must be so closed at the time of packing as to effectually exclude rodents, and to this end the Service inspectors stationed at the various railroad freight terminals have been instructed to prohibit the loading of any freight not conforming to the above requirements.

W. C. RUCKER, Assistant Surgeon General, Commanding.

FOREIGN

Hospital Ship Commandeered.—The British Steamer *Protesilaus* which stopped at Victoria, August 5, on the way from China to Seattle, was boarded by British officers who took command, and ordered her to discharge her cargo of silk. She was then taken to the Esquimaux navy yard where she will be equipped as a hospital ship.

Medical Regulations in Korea.—The American consul general at Seoul has forwarded to the Bureau of Foreign and Domestic Commerce, Washington, a translated copy of the recent orders of the government of Chosen for the control of physicians, dentists, Korean old-style physicians and supernumerary medical advisers or public health officers. These regulations became effective the first of the year.

Medal for Oswaldo Cruz.—The last *Brasil Medico* gives an illustration of the square plaque with a bas-relief bust of Cruz and an allegorical figure on the reverse which was recently presented to him with much ceremony in the name of the Seventh Brazilian Medical and Surgical Congress. To Oswaldo Cruz belongs the honor of the sanitation of Rio de Janeiro which has eradicated yellow fever and transformed its public health record in general; also the more recent sanitation of Para in the rubber district. He has also stamped out plague wherever it has obtained a foothold in Brazil in late years.

Offer to Establish Hospitals.—Mrs. Sarah Wilson and Mrs. George Keppel have offered to establish a French-English hospital at LeTouquetor whenever the French government deems it advisable. The hospital will contain 2,000 beds and will be maintained as long as the war lasts. —The American Ambulance Corps in Paris has secured a building in Neuilly which is to be transformed into a hospital. Twelve American physicians headed by Dr. Joseph A. Blake, New York City, and twenty-four nurses, have volunteered for service and \$9,000 has already been subscribed for the maintenance fund.

Student Congress in Latin America.—The fourth international biennial Pan-American congress of university students is to be held at Santiago in September. The third meeting was at Lima in 1912. There are eleven subjects appointed for discussion at the approaching congress, including suggestions for reforms in the curriculum and methods; higher education of women; the problem of sexual relations from the point of view of the student; comparison of conditions in regard to sanitation and hygiene in the various countries of America, and conditions in regard to professional and industrial life as affecting choice of a career. Rafael Capurro of Lima, Peru, is one of the secretaries of the Oficina Internacional Universitaria Americana.

CANADA

Indemnity Claims.—The late typhoid fever epidemic in Ottawa, Ont., resulted in the preferring of 2,500 claims for indemnity against the Ottawa city council. Of these 681, representing an amount of nearly \$35,000, have been passed for payment.

New Officers.—Alberta Medical Association ninth annual meeting at Medicine Hat July 16 and 17: president, Dr. Robert G. Brett, Banff, secretary, Dr. F. C. Clarke, Calgary. —Vancouver, B. C., Medical Society: president, Dr. William D. Keith, secretary, Dr. J. H. MacDermot.

Dominion Physicians Meet.—The Canadian Medical Association held its annual meeting in St. John, N. B., in July. The next annual meeting will be held in 1915 in Vancouver, B. C., with Dr. R. E. McKechnie, Vancouver, as president. Dr. William W. Francis, Montreal, was re-elected secretary.

New Legislators.—In the recent Manitoba elections the following members of the medical profession were elected to the legislature of that province: Drs. Robert S. Thornton, Deloraine; Dr. McFadden, Emerson; Hon. Dr. W. H. Montague, Minnedosa; and Drs. Armstrong and George Clingan, Virden.

Canadian Physicians Abroad.—Word has been received from Dr. J. George Adami of McGill University that he is at present in Switzerland but will return to London as soon as possible. —When last heard from President Falconer of the University of Toronto was in Sweden. —Mr. Irving Heward Cameron, professor of surgery in the University of Toronto, is in London, England, and expects to return to Toronto in September.

Offer Services for War.—Drs. D. A. McLennahan, Hamilton, David B. Bentley, Sarnia, and Robert E. Wodehouse, Fort William, district officers of health in Ontario, have signified their intention of relinquishing their public health duties and going abroad with Canada's first contingent to the European war. —Dr. John A. Amyot, provincial bacteriologist and professor of public health in the University of Toronto, has offered his services to the federal government for like service.

Personals.—Dr. Samuel J. Streight, Welland, Ontario, has gone abroad for a year. —Drs. Alan G. Brown and J. George A. Campbell have been appointed directors of Child Hygiene, Department of Public Health, Toronto. —Dr. Herbert E. Clutterbuck, Toronto, is doing graduate work in Edinburgh. —Dr. W. Ewart Ferguson, associate editor of *The Canada Lancet*, Toronto, has sailed for Europe. —Dr. David Jamieson, Durham, member for South Grey in the Ontario Legislature is to be the next speaker of that body.

LONDON LETTER

LONDON, July 31, 1914.

THE CLINICAL CONGRESS OF THE SURGEONS OF NORTH AMERICA

(Continued from page 592)

Annual Executive Session

At the annual executive session Dr. Davidson of Illinois presented a report on the standardization of surgery. He said that this should take place on the lines of education and legal enactment modifying and amending the various practice acts in the different states. Dr. Jeff. Miller, New Orleans, presented a report from the committee on cancer. Dr. A. B. Kanavel, Chicago, presented a report on the standardization of hospitals. He said that the replies obtained in answer to a circular from the various hospitals, especially the large hospitals, showed that the project was received with favor. Work should be done by cooperation of the American Medical Association, the American Hospital Association, the Carnegie foundation and various medical educational bodies. The measures proposed were (1) an end-results card catalog, (2) a follow-up system, and (3) an efficiency committee composed of members of all branches of hospital management. A hospital which refused to admit and record its failures and to analyze the reasons for the failure to give relief was not doing its duty. The following officers were elected: president, Charles H. Mayo, Rochester, Minn.; first vice-president, Herbert Bruce, Toronto; second vice-president, R. L. Dickinson, Brooklyn; secretary, F. H. Martin, Chicago; treasurer, A. B. Kanavel, Chicago; general manager, Albert Ballou.

Suture of Levator Ani in Perineorrhaphy

Dr. Henry Jellett, Dublin, opened a discussion on this subject. He pointed out that the levator ani was an essential constituent in the pelvic floor, but none of the older methods provided a means for its suture and many of the present generation of gynecologists continued to practice them because they thought suture of the muscle was difficult and not devoid of danger. Certain writers had introduced unnecessary complications into an operation which was really very simple. The essential features of the operation were as follows: (1) The careful dissection of the necessary amount of vaginal mucous membrane off of the rectum; (2) the exposure and suture of the separated levator ani muscles, and (3) the careful approximation of the cut edges of the vaginal mucous membrane so as to leave no projection or redundancy. The operation was carried out as follows: The extent of the

perineal tear was carefully determined, and its anterior edges were marked out by bullet forceps. A third bullet forceps was applied to the perineal skin just behind the posterior edge of the tear. The position of the separated edges of the levator ani was palpated through the mucous membrane of the vagina. An incision was then made from side to side along the line of junction of the skin and the vaginal mucous membrane. This incision cut through the skin and any underlying scar tissue. A flap of vaginal wall was then dissected up off the underlying rectum. At its lowest part it was firmly held to the rectum and the sphincter ani by cicatricial bands, the result of the healing. As soon as these had been cut through, the separation of the remainder of the flap by blunt dissection was easy. When the dissection of the flap was complete a triangular space was exposed, which was bounded laterally below by the remains of the superficial vaginal and perineal muscles, and at a deeper level by the pubococcygeal fibers of the levator ani muscle, while its floor was formed by the rectum. It was then easy to catch the edges of the levator with clip forceps or dissecting forceps, and to draw them downward and inward until they met in the middle line. If the separation and atrophy of the muscle were marked it might not be possible to draw the edges down sufficiently, but in the great majority of cases they could be brought into view. Three or four interrupted sutures of catgut were then passed through them from side to side, so that when tied they would approximate them in the middle line; for the present, however, they were left untied. The next step was to trim the vaginal flap into proper shape, so that when the operation was complete there might be no redundancy. The cut edges of the flap were then brought together by a continuous catgut suture passed from above downward, and ending at the vulvar orifice. This being done, the catgut sutures in the levator muscle might be tied. The last step consisted in the introduction of silkworm-gut sutures passed so as to close the skin edges of the perineal wound. These sutures were passed from side to side, and traverse the skin and the remains of the superficial perineal muscles, and also the levator muscle so as to supplement the buried sutures.

Transplantation of Ovaries

Professor Tuffier, Paris, read a paper on this subject. The grafting of ovaries from one patient into another was difficult, but might become successful with the improvement of technic, and possibly some chemical substance might be found to protect the implanted ovary from the action of the phagocytes. He described the procedure of grafting the patient's own ovaries into the subperitoneal fatty tissue, the uterus being left *in situ*. The graft could be made in the neighborhood of the uterus or elsewhere. The abdomen was opened, adhesions broken down; the ovary, tubes and glands were isolated; the ovary was then dissected out and embedded in a pouch formed in the subperitoneal fat. The fallopian tubes were then removed. Complete hemostasis was important and asepsis was necessary; otherwise the grafts became cystic or sclerosed. If necessary, the gland could be divided into two parts and each portion engrafted. The implanted ovaries remained inactive for about three or four months after operation, and symptoms of climacteric commenced; then for four or five days the ovary became painful and menstruation recommenced. There was usually a period of six months between the operation and the establishment of menstruation.

(To be continued)

Marriages

GEORGE REED TADOR, M.D., Crystal Springs, Tex., to Mrs. Augusta Jones Hunting of Houston, Tex., at Birchmont, North Conway, N. H., July 29.

EDWARD N. BRUSH, M.D., Towson, Md., to Miss Marie Tregoe Hartman of Forest Park, Md., August 6.

ALBERT CLIFFORD HIRSCHFELD, M.D., Norman, Okla., to Miss Florence Kynette of Dallas, Tex., July 5.

VICTOR ERRILL BELLINGER, M.D., Mt. Pleasant, Iowa, to Miss Regina Kelley, at Des Moines, Iowa, July 26.

EDWARD KENT ARMSTRONG, M.D., Chicago, to Miss Caroline Holmes Focer of Cape May, N. J., August 10.

ALICE JOSEPHINE B. HOPKINS, M.D., and Mr. Clarence Carl Tolg, both of Madison, Wis., June 6.

Deaths

Alfred Mercer, M.D. Geneva, N. Y., Medical College, 1845; a Fellow of the American Medical Association; dean of the medical profession of central New York; professor of minor and clinical surgery, and later professor of state medicine and emeritus professor of medicine in Syracuse University College of Medicine; once president of the Syracuse Medical Society, Onondaga County Medical Society and Syracuse Academy of Medicine, vice-president of the Medical Society of the State of New York and treasurer of the Medical Society of Central New York; a member of the British Medical Association and American Public Health Association; a member of the State Board of Health for five years and of the Syracuse Board of Health for seven years; than whom no medical practitioner in the state was held in greater respect and love; died at his home in Syracuse, August 5, aged 93.

William Henry Carr, M.D. University of Pennsylvania, Philadelphia, 1883; a Fellow of the American Medical Association; a specialist in diseases of the eye, ear, nose and throat; for two years resident physician at the Schuylkill County Hospital; died at his home in Lancaster, Pa., August 2, from injuries sustained in a fall some time before.

Victor Clay Barringer Means, M.D. New York University, New York City, 1882; retired Lieutenant Commander, U. S. N.; a Fellow of the American Medical Association; since his retirement, in 1908, a resident of Philadelphia; died in the U. S. Naval Hospital, Washington, D. C., July 18, aged 54.

Phillip F. Dillon, M.D. Minnesota Hospital Medical College, Minneapolis, 1886; a member of the Rhode Island Medical Society; for sixteen years surgeon to the Soldiers' Home, Bristol, R. I.; a veteran of the Civil War; died at the home of his sister in Anacortes, Wash., July 31, aged 72.

Matthew Joseph O'Connell, M.D. Niagara University, Buffalo, N. Y., 1890; a Fellow of the American Medical Association and superintendent of an institution for the treatment of liquor and drug addiction in Buffalo; died in the institution, August 4, from acute gastritis, aged 52.

Walton Bolgiano, M.D. University of Pennsylvania, Philadelphia, 1892; a Fellow of the American Medical Association; for several years a member of the staff of the Presbyterian Hospital, Philadelphia; died at his home in Baltimore, August 2, from heart disease, aged 46.

Isaac W. Hazelett, M.D. Jefferson Medical College, Philadelphia, 1879; a specialist on diseases of the eye, ear, nose and throat; local surgeon of the Santa Fe System at San Bernardino, Cal.; died in the Pacific Hospital, Los Angeles, August 4, from pneumonia; aged 58.

William I. Wood, M.D. University of Worcester, Cleveland, Ohio, 1888; for ten years a practitioner of Massillon, Ohio, but for a month a resident of Seville, Ohio; died in the German Hospital, Cleveland, August 8, after an operation for appendicitis, aged 56.

Michael W. Raub, M.D. Jefferson Medical College, 1865; a member of the Medical Society of the State of Pennsylvania and a noted ornithologist; curator of Franklin and Marshall College, Lancaster, Pa.; died at his home in Lancaster, August 8, aged 78.

Dryden Hemingway Lamb, M.D. University of Michigan, Ann Arbor, 1891; a Fellow of the American Medical Association and a specialist on diseases of the eye, ear, nose and throat; of Owosso, Mich.; died at his home in that city, about August 5.

Edmond M. Cahen, M.D. University of Southern California, Los Angeles, 1908; a Fellow of the American Medical Association; of Los Angeles; died in that city August 4, it is believed by suicide while despondent over business affairs, aged 29.

Phaon D. Keiser (license, Carbon County, Pa., 1881), for fifty-three years a practitioner of Carbon County; a member of the Medical Society of the State of Pennsylvania; died at his home near Lehighton, Pa., July 31, aged 76.

William Henry Eldred, M.D. Rush Medical College, 1882; Hahnemann Medical College, Chicago, 1883; died at his home in Chicago, August 12, aged 56.

Glenn Orville Hymer, M.D. Marquette University, Milwaukee, Wis., 1910, of Williston, N. Dak.; died in Madison, Minn., July 23, aged 28.

Charles Heselton Foster, M.D. Dartmouth Medical School, Hanover, N. H., 1875; for more than thirty years a practitioner of Lisbon, Maine; died at his home in Riverside, Cal., August 2, from pneumonia.

Cleveland Stuart Stilwell, M.D. College of Physicians and Surgeons in the City of New York, 1875; a director of the Peconic Bank and a retired practitioner of Sag Harbor, L. I., N. Y.; was found dead at his home August 6, from asthma, aged 61.

Daniel McD. Yount (license, North Carolina), a practitioner for fifty-five years; a Confederate veteran; twice a representative in the legislature from Catawba County; died suddenly at his home in Conover, N. C., August 8, aged 81.

Elmer Ellsworth Finch, M.D. Albany, N. Y., Medical College, 1886; a member of the Medical Society of the State of New York; died at his home in Schodack Center, N. Y., July 18, aged 48.

John Albin Hamilton (license, Washington, 1900) of Seattle; a practitioner since 1897; died recently from septicemia following an accidental gunshot received while hunting in Alaska.

William F. Richardson, M.D. American Medical College, Eclectic, St. Louis, 1871; of Pierce City, Mo.; died in Carthage, Mo., August 5, from pulmonary hemorrhage, aged 75.

Henry Hersey Mothersbough, M.D. University of Pennsylvania, Philadelphia, 1879; formerly of Beech Creek, Pa.; died at his home in Altoona, Pa., August 1, from nephritis, aged 70.

Lafayette Coffman, M.D. Maryland Medical College, Baltimore, 1905; a member of the Oklahoma State Medical Association; died at his home in Peggs, Okla., August 3, aged 44.

Albert Roderick Warren, M.D. Eclectic Medical Institute, Cincinnati, 1882; mayor of Pekin, Ill., in 1887; a veteran of the Civil War; died at his home in Pekin, August 5, aged 74.

Charles Henry White, M.D. Harvard Medical School, Boston, 1862; rear admiral U. S. Navy (retired); died at his home in Center Sandwich, N. H., July 26, aged 76.

J. H. Dick (license, Kansas, 1901), a practitioner of Lawrence, Kans., for nearly forty years; died at his home August 6, from cerebral hemorrhage, aged 84.

Amable Aurez Laferriere, M.D. Ecole de Medicine et de Chirurgie, Montreal, 1868; died at his home in New Carlisle, Que., April 28, from arteriosclerosis, aged 67.

Bror Otto Ericson, M.D. Jefferson Medical College, Philadelphia, 1897; died at his home in Cassopolis, Mich., July 7, from inflammatory rheumatism, aged 48.

Dennis Francis O'Callaghan, M.D. Harvard Medical School, Boston, 1887; died at his home in Dorchester, Boston, July 29, from septicemia, aged 50.

Walter Frederick Appleton, M.D. New York Homeopathic Medical College, 1906; of Passaic, N. J.; died in White Haven, Pa., August 2, aged 35.

Frank Jones, M.D. University of Buffalo, N. Y., 1903; of Niagara Falls, N. Y.; died in Memorial Hospital, Niagara Falls, August 4, aged 38.

Albert Southworth, M.D. Homeopathic Hospital College, Cleveland, Ohio, 1869; died at his home in Los Angeles, recently, from dysentery.

Thomas J. Smith, M.D. Cincinnati College of Medicine and Surgery, 1869; died at his home in Coshocton, Ohio, July 23, from gastritis, aged 67.

Charles H. Laas, M.D. University of Louisville, Ky., 1890; died at his home in Burton, Texas, August 4, from congestion of the brain, aged 49.

Solomon L. Reefy, M.D. Eclectic Medical Institute, Cincinnati, 1870; died at his home in Edinburg, Ill., August 2, from paralysis, aged 75.

Robert R. Church, M.D. University of Pennsylvania, Philadelphia, 1870; died at his home in Wormleysburg, Pa., July 30, aged 69.

Henry Marsh Haskell, M.D. Bellevue Hospital Medical College, 1878; died recently at his home in Redlands, Cal., aged 62.

William Wilford McMurdo, M.D. Washington University, St. Louis, 1905; died at his home in Marissa, Ill., August 6, aged 35.

Jerome E. Butler, M.D. University of Louisville, Ky., 1854; died at his home in Aspen Hill, Tenn., July 24, aged 83.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

ARTICLES ON SOCIALIZATION OF MEDICINE

To the Editor:—I am preparing a paper for the society on the "Socialization of Medicine." Please tell me where I can find something on the subject of medical work by contract or under state law in England, Germany, France or other countries, ancient or modern, where the state has taken a hand in such work. P. R. H., M.D., Nebraska.

ANSWER.—The following is a list of articles on this subject:

- A State Medical Service, London Letter, THE JOURNAL, Jan. 31, 1914, p. 391.
- Socialization of Medicine in England, Medical Economics, THE JOURNAL, Jan. 24, 1914, p. 316.
- Warbasse, J. P.: Socialization of Medicine, THE JOURNAL, July 18, 1914, p. 264.
- The Insurance Conflict, Berlin Letter, THE JOURNAL, Feb. 14, 1914, p. 549.
- Benefits of the British Insurance Act, Medical Economics, THE JOURNAL, July 26, 1913, p. 296.
- A New Form of Insurance in England, Medical Economics, THE JOURNAL, Jan. 23, 1909, p. 326.
- Medical Men: Their Place and Influence in the State, Brit. Med. Jour., Feb. 14, 1914.
- Industrial Insurance in Germany, Medical Economics, THE JOURNAL, March 28, 1914, p. 1039.
- Industrial Struggles of Physicians Abroad, Medical Economics, THE JOURNAL, Jan. 31, 1914, p. 398.
- The Place of Medical Men in the Modern State, Medical Economics, THE JOURNAL, April 4, 1914, p. 1112.
- Medical Remuneration under the Insurance Act, London Letter, THE JOURNAL, March 21, 1914, p. 945.
- Mr. Lloyd-George on the Insurance Act, London Letter, THE JOURNAL, March 7, 1914, p. 789.
- Carroll, J. B.: Workmen's Compensation Law and the Physician, Boston Med. and Surg. Jour., Jan. 1, 1914.
- French, J. R.: Medical Situation of New Workmen's Compensation Act, California State Jour. Med., April, 1914.
- Oliver, T.: Medico-Social Problems from an Insurance Point of View, Lancet, London, April 4, 1914.
- The National Insurance Act and Scarcity of Physicians, London Letter, THE JOURNAL, Jan. 17, 1914, p. 218.
- Rogers, B. M. H.: Experiences of Medical Adviser Under Insurance Act, Brit. Med. Jour., June 28, 1913.
- Rowntree, C.: Workmen's Compensation Act and Physician, Practitioner, London, August, 1913.
- Merrick, R. M.: Workmen's Compensation Act as it Affects Physicians, Boston Med. and Surg. Jour., Sept. 18, 1913.
- The Crisis in Germany, Current Comment, THE JOURNAL, Dec. 13, 1913, p. 2163.
- Medical Insurance Abroad, Medical Economics, THE JOURNAL, Dec. 27, 1913, p. 2314.

EFFECT OF LOSING TEMPORARY TEETH

To the Editor:—A patient of mine, a child of 4 years, has had the two upper central incisors knocked out. What, if any, is likely to be the effect on the growth of the jaw, and room for the other (permanent) teeth? The teeth were in perfect alignment before the accident.

WILLIAM H. GOODSON, M.D., Liberty, Mo.

ANSWER.—The accidental removal of the temporary teeth at the age of 4 should have no influence on the growth of the jaw, or on the development of the permanent teeth.

SOURCE OF ARMY ANTITYPHOID VACCINE

To the Editor:—Can you tell me what vaccine (from what laboratory) is used for antityphoid vaccination in the United States Army?

DR. RODGER-CHENOWETH, Escanaba, Mich.

ANSWER.—These vaccines are prepared in the laboratory of the Army Medical School at Washington, D. C. Vaccine from the same source is furnished for the navy and the organized militia as well as other departments of the government service, which call on the army laboratory for it.

BECK'S PASTE

To the Editor:—1. What is the formula for Beck's paste?
2. Is it indicated in treating intestinal fistula?

3. How is it used? C. C. COLLINS, M.D., Roachdale, Ind.

ANSWER.—1. Two forms of paste are used: (a) Bismuth subnitrate 30 parts and petrolatum 60 parts; mix and stir while boiling. (b) Subnitrate of bismuth 30 parts, white wax, 5 parts, soft paraffin 5 parts and petrolatum 60 parts; mix while boiling. One per cent. of solution of formaldehyd may be added to these pastes.

2. No.

3. The paste is sterilized before using. It is sucked up into the syringe while still liquid and cooled to the requisite temperature by running cold water over the syringe. It is injected very slowly and the injection is continued until the sense of pressure annoys the patient. Then the syringe is laid aside and a bit of gauze is held for a time over the outlet of the fistula to keep the paste from running out and an ice-bag is put over the region to harden the injected material.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALBERTA: Edmonton, September 15. Registrar, Dr. Cecil E. Race, University of Alberta, Edmonton.

IOWA: Des Moines, September 10-12. Sec., Dr. Guilford H. Sumner, Capitol Bldg., Des Moines.

MISSOURI: Kansas City, September 28-30. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.

NEW YORK: September 22-25. Chief of Examination Division, Mr. Harlan H. Horner, Department of Education, Albany.

Nevada May Report

Dr. Simeon L. Lee, secretary of the Nevada State Board of Medical Examiners, reports the written examination held at Carson City, May 4-6, 1914. The number of subjects examined in was 13; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 7, of whom 4 passed, including 1 osteopath, and 3 failed. Seven candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Kentucky School of Medicine		(1906)	77.2
Bellevue Hospital Medical College		(1888)	87.4
Royal University of Naples		(1903)	80.9

College	FAILED	Year Grad.
Kentucky School of Medicine		(1907)*
University of Maryland		(1384)†
Eclectic Medical Institute, Cincinnati		(1890)*

* Papers thrown out because of fraud.

† License not granted because of mental condition.

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
State University of Iowa, Coll. of Homeo. Med.	(1908)	Iowa
Tulane University of Louisiana	(1910)	Louisiana
Nebraska College of Medicine	(1907)	Utah
Jefferson Medical College	(1881)	Wisconsin
University of Pennsylvania	(1900)	Pa.
Western Pennsylvania Medical College	(1895)	Pa.

New Mexico April Report

Dr. W. E. Kaser, secretary of the New Mexico State Board of Health and Medical Examiners, reports the written examination held at Santa Fe, April 13-14, 1914. The number of subjects examined in was 13; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 5, all of whom passed. Eight candidates were licensed on satisfactory credentials. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Hering Medical College		(1904)	85.9
American Medical College, St. Louis		(1913)	75
Grant University, Medical Department		(1904)	82.3
University of Tennessee		(1913)	80.2
Royal University of Padua		(1886)	79.8

LICENSED ON CREDENTIALS

Atlanta Medical College	.....	(1897)
Rush Medical College	.....	(1913)
College of Physicians and Surgeons, Keokuk	.....	(1875)
Omaha University, Medical Department	.....	(1902)
Columbia University, Coll. of Phys. and Surgs.	.....	(1904)
Hahnemann Med. College and Hospital, Philadelphia	.....	(1892)
University of Pittsburgh	.....	(1911)
Vanderbilt University	.....	(1893)

Book Notices

HEALTH THROUGH DIET. A Practical Guide to the Uric Acid Free Diet Founded on Eighteen Years' Personal Experience. By Kenneth G. Haig, L.R.C.P., M.R.C.S., with the Advice and Assistance of Alexander Haig, M.A., M.D. Cloth. Price, \$1.25 net. Pp. 227. Philadelphia: J. B. Lippincott Company, 1914.

The importance of diet in securing and preserving health is not to be denied, and when we have a record of personal experience, the results deserve a patient hearing. The book comes to us with a certain handicap since we recognize that the author is thoroughly saturated with his father's peculiar ideas with reference to uric acid and its relation to disease. A glance at the contents soon shows that the term "Diet" is used in a special sense and means a "uric acid-free diet." The adoption of such a diet constitutes admission to a cult which has its stages from the first weaning from tea, coffee and soup, to the full renunciation in which every vestige of the hateful purins has been cast out. This cult uses ordinary terms with strange or exaggerated meanings. To talk of eggs, beans, peas, etc., as poisonous or as containing poison seems strange at first, but we soon learn that the essence of poisons is uric acid and everything which contains or can produce uric acid must at once be classed as poisonous among the initiated, although common people have been consuming such substances for ages without showing any ill effects. Then again, plain chemical terms become perverted in meaning in the dialect of the Haigites. "Cane-sugar is a stimulant by virtue of its acidity" (p. 30). What this may mean we cannot divine, but we believe that chemists still teach that pure cane-sugar is a perfectly neutral substance. Perhaps it may in some forms of metabolism give rise to acid products, but we are not aware that this is an ordinary action, unless forming carbon dioxide be recognized as constituting acidity. Again, we are told that "bread on the whole is not a very satisfactory food because it is very acid" (p. 23). It would appear that those saved from the horrors of uric acid have become so sensitive that they revolt at sour bread and we are sorry that England will not furnish them bread sweet enough to eat. The author has a new standard of nutrition, gauging the nutritive value of foods by their content of protein. Thus sugar, starch and butter or other fat are devoid of nutritive properties since they contain no protein.

The distinctness of view of those converted to the new way of life is shown by the following: "The chief argument against cheese as a food is that it is indigestible; from the meat eater's point of view this is so, but it does not hold for those on the Uric Acid-Free diet" (p. 15). The reader will also be interested in the following: "Peanuts, which are botanically not nuts at all, but pulses, are poisonous." "Bread made with baking-powder is certainly to be preferred to that made with yeast, which is poisonous." Lest the House of Haig be overlooked we find at intervals of about ten pages the title, publisher and author of "Some Recipes for the Uric Acid-Free Diet," by G. M. Haig.

The difficulties of the author and of other Haigites in a purin-eating world are enough to excite our sympathy. When venturing into profane society the author tells us that he usually takes some sustenance before leaving home "and then when I get there I eat what I can and play about with the rest, hiding the poisonous things under the knife and fork. This of course is not pleasant, but the matter has got to be faced out." A sad predicament indeed! A waterproof pocket in the dinner-coat to hold the "poison" would surely be handy. The author makes some comforting statements in regard to the effect of the new way of living which we gladly quote. "My temper certainly has been improved by being on Uric Acid-Free Diet." "Another small point is, that since I have been on Diet I have not been bothered by the unwelcome attentions of the flea, the midge, the mosquito and others of the kind. . . . This is a common experience amongst those on the Uric Acid-Free Diet." "Getting out of bed in the morning has no terrors for me and I find

the morning the best time for work." Dr. Haig still believes in cooking. He looks forward to an ideal diet consisting of fruit and nuts which will need no cooking, but in the times of imperfection in which we find ourselves he cannot dispense with the culinary art. As a scientific treatise, this book is valueless. As a specimen of the literature of a self-satisfied sect or fad it will prove interesting to any one who will take the trouble to read it.

MODERN ANESTHETICS. By J. Frederick Silk, M.D., Senior Anesthetist, King's College Hospital. Cloth. Price, \$1 net. Pp. 200, with 37 illustrations. New York: Longmans, Green & Co., 1914.

As the author says the principal object of this book is to describe in detail those procedures which he has found most useful in his own practice. The anesthetics most commonly used are briefly described, after which the technic to be followed and the difficulties most likely to occur are discussed. The choice of anesthetic in the judgment of the author should be the subject of a consultation between the surgeon, the medical adviser and the anesthetist. He gives his own views as derived from experience, but not in such a way as to be of great assistance to one in doubt. Silk gives little information in reference to the newer anesthetics, and particularly with reference to the use of alkaloids his advice is very indefinite. He is evidently carefully conservative, not wishing to discredit anything that may be of service, but placing the emphasis on those methods which his experience has shown him to be of tried worth. In indicating the principles to follow in choosing the anesthetic, he points out that the nature of the operation should have weight in determining which agent to employ. He states that although there is a general impression that children bear anesthetics well, there is a considerable mortality from this cause and that the number of children who escape by a slight margin is still greater. The technic of administration is fully described and the difficulties and dangers thoroughly considered. The later chapters of the book discuss operations on special regions and the methods of spinal and local anesthesia and analgesia. The author cannot be said to be optimistic for local methods, although he admits that they are especially appropriate in the operations on the eye and the nasal mucous membrane. The anoci-association method of Crile is given in Crile's own words. The brief comments made on the method are favorable.

A MANUAL OF CLINICAL DIAGNOSIS BY MEANS OF LABORATORY METHODS FOR STUDENTS, HOSPITAL PHYSICIANS AND PRACTITIONERS. By Charles E. Simon, B.A., M.D., Professor of Clinical Pathology at the College of Physicians and Surgeons. Eighth Edition. Cloth. Price, \$5 net. Pp. 802, with 210 illustrations. Philadelphia: Lea & Febiger, 1914.

In this edition, Simon has included, among other additions, a discussion of the important serodiagnostic tests of Abderhalden based on the appearance of the "protective ferments" in the blood-serum; the applicability of the complement-fixation test to latent gonorrheal infections, and the phenolsulphonephthalein test for renal activity. The subject-matter of the book is divided into two parts. The first is devoted to technical questions and the second to the application of laboratory findings to diagnosis. This is an excellent arrangement, as any one who has had experience with students in this subject will agree. The tests discussed throughout the work, are for the most part, very satisfactory and may be accepted as the best for the matter in hand. Halin's newer methods of studying the various nitrogen factors of the blood have been wisely included. It is noted that Simon prefers the Noguchi acetone-insoluble lipoid antigen for the Wassermann reaction, although he states that he is about to employ the cholesterolized alcoholic extracts in his work. The latter antigens are, in our opinion, the best at our disposal. No mention is made of Benedict's qualitative test for sugar in the urine, which test is probably the most satisfactory one for routine purposes. Further, we are able to find no reference to the formaldehyd-titration method for ammonia and amino-acids or to Lange's colloidal gold test of the cerebrospinal fluid. Both of these tests would seem to be of sufficient value to warrant inclusion. This work is

to be recommended to all who may desire a thoroughly reliable and up-to-date treatise on clinical diagnosis. The discussions are clear and exact. The selections of methods are entirely adequate. The illustrations are good and the color plates especially worthy of mention.

THE PRINCIPLES AND PRACTICE OF GYNECOLOGY. For Students and Practitioners. By E. C. Dudley, A.M., M.D., Professor of Gynecology, Northwestern University Medical School. Sixth Edition. Cloth. Price, \$5 net. Pp. 795, with 463 illustrations. Philadelphia: Lea & Febiger, 1913.

There are few medical text-books in this country that for so many years have been regarded as standard as has this one of Dudley. In 1902 the present reviewer wrote, "Dudley's book has always been held in high esteem both by the specialist and by the general practitioner who is compelled to do a certain amount of gynecologic work, and this edition will, we are sure, make it still more popular." This was written twelve years ago in reviewing the third edition; it was then an old and well-known text-book. The popularity of Dudley's Gynecology rests, primarily, on the fact that the subject-matter is presented in a practical manner with sufficient elementary details to satisfy the general man, but not so much as to offend the specialist; and, secondarily, on the fact that the book is liberally and beautifully illustrated with what surely may be regarded as practical and useful illustrations. The sixth edition has been brought up to date in every particular. There is scarcely a chapter that does not bear evidence of revision. Many large illustrations have been added, making the book better than before in this regard at least. In a word, this book may be regarded as a standard text-book representing modern gynecology.

DEVELOPMENT AND ANATOMY OF THE NASAL ACCESSORY SINUSES IN MAN. Observations based on Two Hundred and Ninety Lateral Nasal Walls, Showing the Various Stages and Types of Development of the Accessory Sinus Areas from the Sixtieth Day of Fetal Life to Advanced Maturity. By Warren B. Davis, M.D., Assistant Demonstrator of Anatomy in the Daniel Baugh Institute of Anatomy, Philadelphia. Cloth. Price, \$3.50 net. Pp. 172, with 57 illustrations. Philadelphia: W. B. Saunders Company, 1914.

This book is mechanically excellent. It contains fifty-seven slightly tinted accurate and very clear cuts illustrating the nasal accessory sinuses at all stages from embryonic to adult life. The legends explaining the various figures are satisfactory, so that anatomic features may be taken in quickly. The text is clear and concise, yet comprehensive, and all in all it is a valuable addition to the literature of the development and anatomy of the region specially interesting to the rhinologist.

PLAIN RULES FOR THE USE OF TUBERCULIN. By R. Allan Bennett, M.B., Physician in Charge of Devon County Council Tuberculosis Dispensary. Cloth. Price, \$1 net. Pp. 48. New York: William Wood & Co., 1914.

This small book containing twenty pages of useful text gives plain and conservative directions as to the technic and indications for tuberculin treatment. It is by no means exhaustive, but it may be said to be reliable. The author opposes the system by which general reactions are allowed to occur, but thinks that for working people the plan of procedure that avoids all reactions consumes too much time. Hence he aims to graduate the doses so that while focal reactions may occur, the general reactions are avoided. In his estimate of the relative value of the methods, he puts the combination of sanatorium and tuberculin first, sanatorium alone second, and tuberculin third.

BLACK'S MEDICAL DICTIONARY. By John D. Comrie, M.A., B.Sc., M.D., Lecturer on History of Medicine, University of Edinburgh. Fifth Edition. Cloth. Price, \$2.50. Pp. 858, with 353 illustrations. New York: The Macmillan Company, 1914.

This is an encyclopedic, one-volume dictionary intended for the use of lay persons who wish an explanation of medical terms and conditions in non-technical language. The text has been thoroughly revised and is well up-to-date. So far as a brief examination indicates, the work fulfils its purposes satisfactorily.

Miscellany

One Standard of Entry to the Practice of the Healing Art

The following statements, made by Dr. F. M. Crandall of New York a few years ago in regard to the various systems of drugless therapy, apply with equal force to-day. The followers of some of these "systems" are persistent in their efforts to lower educational standards or break down the requirements of medical practice acts in order that they can enter on the practice of the healing art without having to comply with the educational requirements or to present the qualifications which are deemed necessary for all other practitioners. There should be no special privileges granted to any "system." The people of every state have a right to insist that only properly qualified persons are given the legal right to treat human ailments.

"The most strenuous work of recent years has consisted of opposition to the demands of various systems of pseudo-medicine. These systems are nothing more or less than levers and sledge hammers seized upon as the most effective means of breaking through the medical laws. And here we come upon a subject upon which there is much misapprehension. The medical laws are but a part of the general educational laws of the state. These laws are wide in their application, and cover many professions and diverse conditions. There is nothing exceptional in the laws covering medical practice. They are at the farthest possible remove from class legislation. They are simply a part of the great educational system of the state. The medical profession has upheld the hands of the state educational authorities, whose aim has been to enact a broad and consistent system of just and equitable laws. A state educational system has, therefore, been built up, of which the laws controlling medical practice are an integral part.

"POSITION OF THE MEDICAL PROFESSION

"The position of the medical profession is often misunderstood and their arguments have frequently been misjudged. The opposition of physicians to attempts to destroy the medical laws is often attributed to a spirit of trade unionism. This is controverted by the single fact that no attempt is made by the profession to curtail the practice of medicine by competent men. It is one of the fundamental principles that every man and woman exhibiting proper qualifications should be admitted to practice. Our opposition to pseudomedicine is, and should be, educational, not professional. We do not try to raise barriers against practitioners because they use a special system or adopt certain remedial measures. We do not oppose certain prevalent isms because of their methods of treatment, but because they are new and very clever manifestations of the old, old scheme to get within the medical fold without expending the time and money necessary to make a competent practitioner. The various systems of pseudomedicine are not pushed forward year after year with such determination because men so love this or that particular form of treatment, but because they offer the most promising means of evading the requirements of preliminary education, four expensive years in the medical college, a state examination, and then, perhaps, two years of unpaid service in a hospital. It is the educational question that is at the bottom of every one of these modern isms, and they are the more aggressive as the educational barriers are raised higher. It is upon educational, not professional grounds that we oppose them.

"TREAT ALL ALIKE; NO SPECIAL FAVORS

"The medical profession approves the system which requires the same general professional education of all its members. The specialist upon the eye and the specialist upon the throat, the physician and the surgeon, must each undergo the same training and must pass the same state examination. One may select any specialty he chooses and may adopt any method of treatment which his educated judgment dictates. He may use large doses or small, massage or electricity. What the state requires for one body of practitioners it should not abate in favor of another.

"AN ADEQUATE TRAINING REQUIRED

"We have one sound reason for opposing these systems which permit an abbreviated education, and one argument that no man can gainsay. We may properly demand that

every man and woman who enters upon the practice of the healing art should have adequate education. Here we are on ground that cannot be misjudged or misrepresented. We ask no favors or special privileges. We are not the ones who are seeking to bring half-educated practitioners in by the back door. We simply ask equal requirements for all. Our position is, that those who seek to treat disease should go in through the same door, and a few should not be permitted to crawl in through holes and underground passages. We simply ask for an American square deal and equal rights for all."—*New York and Philadelphia Med. Jour.*, reprint *Jour. Med. Soc. New Jersey*, January, 1906, p. 247.

The Supposed Experimental Production of Hemolymph Nodes and Accessory Spleens

Owing to the conflicting evidence at hand concerning the production of accessory spleens and hemolymph glands *de novo* or from lymph-nodes, Arthur William Meyer (*Jour. Exper. Zool.*, 1914, xvi, 241) has made further experimental investigation of this important subject. It has been customary to classify the lymph-glands as hemolymph nodes and ordinary lymph-glands. Both types of glands or nodes have been supposed to occur in man, monkeys, rodents, domestic animals, birds and fishes. Those who attempted this study found that between these two types of lymph-nodes neither gross nor microscopic differentiation was possible. No definite characteristics could be assigned to either class, because the observer thought that all forms of transition existed. In spite of this acknowledged difficulty of differentiation, Levoe and Warthin formulated elaborate classifications, and men such as Tizzoni, Ethernod and others have described splenic nodules, on the peritoneum and on the great omentum, which they regarded as the result of physiologic compensation for the inactivity of the main spleen. On this supposition Tizzoni performed several splenectomies on dogs with the hope of proving his conclusion. He recorded no controls and gave no details regarding these dogs, such as their age, weight, or the size and position of the accessory spleens which he described. Foa and Luschka have already pointed out that the so-called accessory spleens are found also in the presence of a normal spleen. Of the thirty splenectomies which Mosler performed, the great omentum of only one dog was covered with dark-red nodules. Even granting that these were accessory spleens there is no proof that they were found as the result of splenectomy.

Meyer's experiments were carried out on dogs from two litters of five each. He performed splenectomies on eight, keeping one dog from each litter for a control. At the time of the operation they were examined for hemal nodes, and only one node was found with a reddened center in the gastrosplenic omentum. At the time of necropsy, from thirty to 126 days after operation, neither accessory spleen or hemolymph nodes were found, and all of the lymph-glands in the splenectomized dogs were normal, except in two dogs in which the bronchial lymph-nodes were intensely red. These nodes were injected and the afferent trunks were plainly visible up to the lung, which they entered, while the efferent trunks joined the larger mediastinal vessels near the jugulosubclavian junction. Furthermore, he examined seventy dogs and approximately one hundred cats, selected at random. Those nodes which were under suspicion were taken from the animals, examined microscopically and found to be normal lymph-nodes of the ordinary type.

Further experiments were made on five guinea-pigs of known weight. Guinea-Pig 1 was given injections of distilled water; Guinea-Pig 2 of oxalic acid, and Guinea-Pigs 3, 4 and 5 injections of diphtheria toxin. One hemolymph node was found in both 4 and 5; but since Retterer has shown that the reddish lymph-nodes occur in normal guinea-pigs, of all ages and under all conditions, Meyer is forced to conclude that the foregoing results are not necessarily due to his experiments. These reddened nodes were injected and found to maintain their previous connection with the lymphatic system.

It has long been known that changes in the lymph-nodes occur following various pathologic conditions, and that they

also remain unchanged and are not converted into another organ with a different function, losing their connection with the lymphatic system.

Investigation of animals subjected to bleeding has brought the same results. From these experiments Meyer concludes that the injection of toxins, bleeding or the removal of the spleen fails to produce any change of lymph-nodes into hemal nodes, thereby disproving Tizzoni's experiments which have been accepted for decades.

Some Mortality Statistics

The present population of the United States is not far from 100,000,000. The number of persons of both sexes, aged 70 and over, in 1910 was 2,270,021. According to the latest English life tables, out of every million born 277,351, or 27.7 per cent., may normally expect to reach the age of three-score and ten. In the United States the annual number of births is about 2,500,000, and the annual number of deaths is about 1,350,000. Of those who died during 1912, approximately 236,500, or 17.6 per cent., had lived less than one year, and 329,400, or 24.4 per cent., had lived less than five years.

The principal causes of death are as follows: first, tuberculosis, which affects every period of life and causes in the aggregate about 154,000 deaths; second, heart diseases, also affecting every period of life, but chiefly persons over 40, causing a mortality of about 150,000; third, nervous diseases, which account for about 138,000 deaths; fourth, pneumonia (all forms), about 132,000; fifth, intestinal diseases, about 123,000; and sixth, genito-urinary diseases, about 111,000. Following these six, in the order of importance, are accidents, causing about 182,000 deaths, and tumors, malignant and benign, about 75,000. These eight groups of cases combined account for about 72 per cent. of the aggregate mortality of the United States, which, as previously stated, is approximately 1,350,000 per annum. Other important causes are typhoid fever, the mortality from which is about 20,000 per annum; suicides, numbering approximately 16,000; deaths from parturition, about 15,000, and homicides, 6,000 to 7,000.

This may be considered the normal mortality of a civilized country not subject to exceptional or uncontrollable mortality conditions, such, for illustration, as continue to affect a great country like India even at the present time. The death-rate of the registration area of the United States during 1912 was only 13.9 per thousand, against a death-rate of 32 for British India. Of the 7,500,000 deaths, in round numbers, during the year 1911, 354,000 were caused by cholera, 58,000 by small-pox, 733,000 by plague, and 4,200,000 by fevers. Most of these causes are no longer an affliction of modern civilized countries, and they are fortunately brought slowly under control in the Indian Empire, where the death-rate has gradually been reduced from extraordinary proportions to a rate not much above the normal for the large cities of this country fifty years ago. The best illustration of India's marvelous sanitary progress is to be found in the reduction of the death-rate of the European army during recent years. Military discipline and conformity to sanitary rules and regulations, no doubt, largely account for this reduction, which has been of immeasurable benefit, not only to the European, but also to the native population.—The Chances of Death and the Ministry of Health, by Frederick S. Hoffman, Yale address.

Hints to Authors

1. Make your articles as short as is compatible with a clear expression of your facts or ideas. Many an article is not read because it is so long; or else its point is smothered in verbosity.

2. Leave Hippocrates and the other ancients undisturbed. They should rest now.

3. Do not spoil your work with a lot of quotations from foreign authors. Refer to them, if you must, in a footnote.

4. Have your paper typewritten and with wide-spaced lines; and,

5. Keep a copy.—*South. Med. Jour.*

Medicolegal

Liability for Operations Performed without Consent in Charitable Hospitals

(*Schloendorff vs. Society of New York Hospital (N. Y.), 105 N. E. R. 92*)

The Court of Appeals of New York affirms a judgment for the defendant hospital in this action wherein the plaintiff sued for damages alleged to have been sustained from an operation alleged to have been performed on her in the defendant hospital without her consent. The court says that, taking the plaintiff's version of the case, she went to the hospital suffering from some disorder of the stomach, and later consented to an examination under ether in order that the character of a lump which had been discovered might be determined, but that there must be no operation; yet, while she was unconscious, a tumor was removed. Her testimony was that this was done without her consent or knowledge, although that was sharply contradicted. Following the operation, and, according to the testimony of her witnesses, because of it, gangrene developed in her left arm, some of her fingers had to be amputated, and her sufferings were intense.

The Court says that every human being of adult years and sound mind has a right to determine what shall be done with his own body; and a surgeon who performs an operation without his patient's consent commits an assault, for which he is liable in damages. This is true, except in cases of emergency when the patient is unconscious, and when it is necessary to operate before consent can be obtained.

The fact that the wrong complained of here was trespass, rather than negligence, distinguished this case from most of the cases that have preceded it. In such circumstances the hospital's exemption from liability could hardly rest on implied waiver. Relative to this transaction, the plaintiff was a stranger. She had never consented to become a patient for any purpose other than an examination under ether. She had never waived the right to recover damages for any wrong resulting from this operation, for she had forbidden the operation. In this situation, the true ground for the defendant's exemption from liability was that the relation between a hospital and its physicians is not that of master and servant. The hospital does not undertake to act through them, but merely to procure them to act on their own responsibility. The wrong was not that of the hospital; it was that of physicians, who were not the hospital's servants, but were pursuing an independent calling, a profession sanctioned by a solemn oath, and safeguarded by stringent penalties. If, in serving their patient, they violated her commands, the responsibility was not the hospital's; it was theirs. There is no distinction in that respect between the visiting and the resident physicians. Whether the hospital undertakes to procure a physician from afar, or to have one on the spot, its liability remains the same.

It is also true of nurses, as of physicians, that, in treating a patient, they are not acting as the servants of the hospital. The hospital undertakes to procure for the patient the services of a nurse. It does not undertake, through the agency of nurses, to render those services itself. Whatever the nurse does in the preliminary stages is done, not as the servant of the hospital, but in the course of the treatment of the patient, as the delegate of the surgeon to whose orders she is subject. The hospital is not chargeable with her knowledge that the operation is improper, any more than with the surgeon's.

Waivers of Privilege

(*State vs. Long (Mo.), 165 S. W. R. 748*)

The Supreme Court of Missouri says that it concedes the statute of privilege to be a wise one, but it should never be so construed as to make it both a shield and a dagger at one and the same time. If the patient is suffering from a malady, the physicians should not be allowed first to bring to light that affliction of the patient. The very purpose of the statu-

is to hide, as with a veil, the malady and trouble for which the physician treated her, and what may have passed between them in the confidential relationship of physician and patient. But when the veil has been lifted by the patient, or with her consent, and the secrets of the sick chamber are given to the world, what logic is there in saying that the patient can clog the wheels of justice itself, by closing the mouth of other physicians, who know the real facts? In other words, if the patient raises, or permits to be raised, the veil of secrecy, with lying lips as to what the conditions were, should this waiver of secrecy still leave to her the power of suppressing the truth, by objecting to other physicians who about the same time treated her for the same alleged trouble? The court thinks not. In other words, if a patient is suffering from a given malady, and is treated by several physicians near the same time, for the same trouble or malady, then if she and one of her physicians with her consent make public the character of her trouble, she has waived the right longer to keep the exact character of that trouble secret, and the other physicians are competent to testify as to what this malady or trouble was in reality. Any other rule would be but to permit a patient in a court of justice to play both fast and loose.

So, if a patient is injured in a railway wreck and calls several physicians in the course of a reasonable time to treat him for such injuries, changing at times from one to another, but all treating him for the selfsame trouble, then if the patient breaks the secrecy by permitting one to testify as to the character of his injury, it is broken as to all. Any other construction of the doctrine of waiver (a doctrine thoroughly recognized in this state) would permit the patient to continue to employ physicians until he got one to his choosing, and, when he did so, could make him the sole agent to make public the secret of the sick-room. Such a course would be an abhorrent fraud on the courts, and one for which they should not stand. Justice should not be trifled with in any such manner. And, if privilege is once waived, it remains waived until the determination of the case, it matters not how many trials may be required.

Emergency Requirements for Injured Railway Employees

(*Tifpecanoe Loan & Trust Co., administrator, vs. Cleveland, Cincinnati, Chicago & St. Louis Railway Co. (Ind.)*, 104 N. E. R. 866)

The Appellate Court of Indiana, Division No. 1, says that if an employee of a railway company is injured as a result of hazards to which his employment exposes him, and, if his injuries are of such a nature as to render him incapable of caring for himself, it becomes the duty of the company to take such steps as are reasonably necessary and proper, under the circumstances, to prevent an aggravation of the injury through exposure, or for the want of medical or surgical assistance. Under such circumstances, if the servants of the company knowingly leave such injured person to die of exposure, or to bleed to death from his wounds, a legal responsibility for such consequences will be imposed on the company; and, if they take him into their custody, they must exercise reasonable care in the treatment accorded him. Under such circumstances the common instincts of humanity require that the helpless injured person should be taken in charge and removed to a place of safety, and that, if necessary, medical or surgical aid should be provided. This duty has been recognized by the Supreme Court of this state as one which arises in extraordinary cases in which medical or surgical assistance is imperatively required to save life, or to prevent further serious bodily injury. It is said that the duty arises with the emergency, and with it expires. In this case a section-hand in the employ of the defendant had his leg broken and severely cut, and was rendered unconscious and incapable of taking care of himself. There were some averments in the complaint to the effect that the company's physician, who was the first to treat the injured man, was negligent in failing to disinfect the wound, and to remove the gravel, sand, cinders, and other foreign substances from the wound, and that as a result blood poisoning

ensued, which resulted finally in death. It is well settled in Indiana, however, that a railway company cannot be held liable for damages resulting to one of its injured employees as the result of the negligence of a surgeon called by the company to render surgical aid to such employee. Therefore, as the complaint did not aver that the defendant or its agents were negligent in selecting and employing an unskilled or incompetent surgeon, the defendant could not be held liable for the negligence or unskillfulness of the surgeon whom it called.

Society Proceedings

COMING MEETINGS

- Amer. Assn. of Obstetricians and Gynecologists, Buffalo, Sept. 15-17.
American Electro-Therapeutic Association, Battle Creek, Sept. 15-17.
American Roentgen Ray Society, Cleveland, Sept. 9-12.
Colorado State Medical Society, Boulder, Sept. 8-10.
Indiana State Medical Association, Lafayette, Sept. 24-25.
Kentucky State Medical Association, Newport, Sept. 23-25.
Med. Soc. of the Mo. Valley, Des Moines and Colfax, Ia., Sept. 17-19.
Michigan State Medical Society, Lansing, Sept. 11-12.
Oregon State Medical Association, Portland, Sept. 10-11.
Pennsylvania State Medical Society, Pittsburgh, Sept. 21-24.
Utah State Medical Association, Salt Lake City, Sept. 29-30.
Washington State Medical Association, North Yakima, Sept. 21-23.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Insanity, Baltimore

July, LXXI, No. 1, pp. 1-232

- 1 Relations of Internal Medicine to Psychiatry. L. F. Barker, Baltimore.
- 2 *What is Paranoia? E. S. Abbot, Waverly, Mass.
- 3 General Paralysis as Public Health Problem. T. W. Salmon, New York.
- 4 Differential Diagnosis of General Paresis. A. Meyer.
- 5 *Is There an Increase Among the Dementing Psychoses? C. P. Bancroft, Concord, N. H.
- 6 Analysis and Interpretation of Dreams Based on Motive of Self-Preservation. M. Solomon, Chicago.
- 7 *Brain Atrophy in Relation to Insanity. A. J. Rosanoff, Kings Park, N. Y.
- 8 *Similar and Dissimilar Psychoses in Relatives. C. Ricksher, Kankakee, Ill.
- 9 Intoxication Psychosis Associated with Cirrhosis of Liver. G. H. Williams, Columbus, Ohio.
- 10 Atypical Modes of Onset in Dementia Praecox. S. N. Clark, Kankakee, Ill.

2. What is Paranoia?—Unless one uses the word merely in a symptomatic or descriptive sense (in which case it is an unnecessary synonym for the old delusional insanity), Abbot says, paranoia is a psychosis, but not a disease process. It is neither a pure affect-psychosis nor a pure ideation-psychosis, but rather a combined associational affect-ideation-psychosis. It is a continuous self-perpetuating faulty association of ideas and affects without disturbance of the thinking or affective or conative processes of such. It is purely functional, but not related to the manic-depressive or dementia praecox psychoses, which are ordinarily, though to his mind wrongly, called functional. Hence it does not lead to dementia, except in the line of its own evolution and it does not necessarily have any of the symptoms of the other psychoses except delusions, which may occur in all of them. Its mechanism is that of prejudice but the basal complexes involved are very intimate and personal ones with correspondingly strong and durable affects. This conception gives some therapeutic hope, realized by Abbot in at least one case.

5. Are Dementing Psychoses Increasing?—Bancroft feels that while it is demonstrably certain that paresis has increased during the last twenty-five years, it is by no means equally certain that an actual increase in the other dementing

psychoses has occurred. Fundamental conditions are much the same now as they were fifty years ago. With the exception of parasymphilitic brain conditions the actual disparity between the functional diseases of the mind and the dementing psychoses is probably not much greater now than formerly, making due allowance for increase in population. Certain prophylactic endeavor is suggested by this cursory survey. Curtailment of the immigration of mental defectives at the source, restriction of alcoholic indulgence, prevention of syphilitic infection, stricter segregation of the feeble-minded, greater intelligence in entering on the marriage relation. Bancroft suggests, are some of the steps by which a decrease among the dementing psychoses may be attained.

7. Brain Atrophy in Relation to Insanity.—The more important results of Rosanoff's analysis are: The index of atrophy seems to vary somewhat with age, showing increase as age advances. The index to atrophy seems also to vary with the state of nutrition, though not so clearly, showing apparently some increase in cases of emaciation. In cases of insanity the index of atrophy varies with the clinical group; it is greatest in cerebral arteriosclerosis; it is greater in general paresis and in senile dementia than in dementia praecox.

There is close correlation between degree of mental deterioration observed clinically and index of atrophy determined at autopsy: that is to say, mental deterioration, of whatever nature, goes hand in hand with brain atrophy. There is close correlation between duration of the deteriorating psychosis and index of atrophy. Inasmuch as interest will naturally center on dementia praecox, rather than on psychoses occurring on a basis of coarser and better understood brain lesions, a special analysis of the data pertaining to that group has been undertaken with a view to determining the share of the atrophy which is in that connection to be attributed to senility or to emaciation. This analysis has shown Rosanoff that if senile involution plays any part in the production of brain atrophy in dementia praecox, that part is but a slight one; the bulk of the atrophy is not due to it. The analysis has also shown that emaciation, like senile involution, plays but an unimportant part, if any, in the production of brain atrophy in dementia praecox; the bulk of the atrophy is not due to it. The conclusion is therefore drawn by Rosanoff that dementia praecox is associated in some way with changes in the brain which lead to atrophy.

8. Similar and Dissimilar Psychoses in Relatives.—Ricksher found that similar psychoses occur in about 50 per cent. of parents and children, and in brothers and sisters occur in about 66 per cent. of the cases. The age of onset of the psychosis as a rule is earlier in the child than in the parent. When the father and daughter or mother and son each suffer from dementia praecox the difference in the age of onset is most marked. Idiot children are not found as often as children with less severe mental disorders. Epilepsy in their cases was transmitted through the fathers to the sons. The transmission from mother to child is only a very little more frequent than from father to child. Similar psychoses occur in brothers and sisters in about 66 per cent. of cases. Dementia praecox is the most frequent psychosis found in brothers and sisters and is the psychoses most frequently found in one child when the brother or sister suffers from some other mental disorder. Mental disease is more apt to appear earlier in sisters than in brothers, except that when dementia praecox is found in one child and manic-depressive insanity in the other the average of onset is less in the brother than in the sister whether the brother suffers from manic-depressive insanity or from dementia praecox. Family histories and the type of psychoses in other insane relatives are not obtainable and definite conclusions regarding the effects of insanity in relatives on the production of dissimilar psychoses in the child cannot be drawn.

American Journal of Roentgenology, Detroit

May, No. 7, pp. 287-312

- 11 Direct Method of Diagnosis of Duodenal Ulcer by Means of Roentgen Ray. A. W. George and I. Gerber, Boston.

- 12 *Roentgen Examinations for Head Injuries. A. L. Gray, Richmond, Va.
13 Experiments in Standardization of Dosage for Roentgen Therapeutics. G. W. Holmes, Boston.

12. Abstracted in THE JOURNAL, Nov. 15, 1913, p. 1842.

Archives of Pediatrics, New York

July, XXXI, No. 7, pp. 481-560

- 14 *Schick Reaction and Its Practical Applications. W. H. Park, A. Zingher and H. M. Serota, New York.
15 *Treatment of Recurrent Sibilant Bronchitis. B. K. Rachford, Cincinnati.
16 Splenic Enlargement in Infancy and Childhood. C. V. Weller, Ann Arbor, Mich.
17 Cases of Diarrhea Treated with Culture of Bacillus Bulgaricus. C. W. Berry, Brooklyn.
18 Children's Tuberculosis Class at Sanatorium. M. Solis-Cohen, Philadelphia.

14. Schick Reaction.—The results of immunizing injections and laboratory experience in testing the blood for antitoxin have shown that only those individuals contract diphtheria who have no antitoxin or only a minute amount in their blood and tissues. The methods previously in use for estimating antitoxin, and thus separating the susceptible from the non-susceptible individuals, have been too troublesome to be of practical value in routine cases. Schick recently published a simple clinical test by which this can be accomplished. The reaction depends on the local irritant action of minute quantities of diphtheria toxin when injected intracutaneously. If antitoxin is absent, or present only in very small amounts, insufficient for protection, a positive reaction will appear in twenty-four to forty-eight hours. This is characterized by a circumscribed area of redness and slight infiltration which measures from 1 to 2 cm. in diameter. It persists for seven to ten days, and on fading shows superficial scaling and a persistent brownish pigmentation. The amount of toxin injected as advised by Schick is 1/50 MLD for the guinea-pig in 0.1 c.c. of normal saline. The authors prefer 1/50 MLD in 0.2 c.c.

The Schick reaction was carried out by them during the past six months on all patients entering the scarlet-fever pavilion of the Willard Parker Hospital. In all, 700 patients were thus tested, and of these, 400, or 57 per cent., gave negative reactions. Only cases giving positive reactions were immunized; those giving a negative reaction received no immunization, but were carefully observed. Although more than a quarter of the negatively reacting patients became bacillus carriers during their stay in the wards, no cases of clinical diphtheria developed among them. The remaining 300 patients who gave positive reactions received in practically all cases some form of toxin-antitoxin mixture. Among those who reacted insufficiently to the attempt at active immunization with toxin-antitoxin mixtures, 42 developed clinical diphtheria; of these, 20 were nasal, 20 tonsillar and 2 laryngeal diphtheria. The great majority of the cases were of a mild type. The percentage of individuals susceptible to diphtheria is greatest between the ages of 1 and 4 years. It is less during the second six months of life and less in older children and in adults.

15. Treatment of Recurrent Sibilant Bronchitis.—Rachford calls attention to the clinical fact that (1) recurrent rhinitis and recurrent sibilant bronchitis, which are sometimes associated with rather severe asthmatic attacks, and almost always with a severe paroxysmal cough, are very commonly caused by some kind of food intoxication; (2) that recurrent attacks of rhinitis and whistling bronchitis, which is one of the most common symptom groups the physician is called on to treat, may be in most instances almost or quite relieved by dietetic treatment. He insists that this symptom group occurs not infrequently in children who have a predisposition to migraine, recurrent vomiting and urticaria.

During the attack sweets, butter fats, eggs and raw fruits are especially to be avoided. Strawberries, rhubarb, tomatoes, salads, shell-fish, tea, coffee, pastry, gravies, cream, cod-liver oil and alcohol are excluded from the diet. Saccharin is to be used instead of sugar. Skimmed milk may be allowed. The following foods may be allowed: beef, mut-

ton, fowl and fish in moderation, cereals, bread, all vegetables not above prescribed, cooked fruits, skimmed milk and thick soup.

About two months after the patient has recovered from the attack the above diet may be carefully modified by adding one egg a day to the diet, then perhaps two weeks later, milk containing 4 per cent. fat may be substituted for skimmed milk. Some few weeks later all raw fruits, oranges excepted, may be added to the diet. Some weeks later, small quantities of sugar may be used for sweetening cereals and stewed fruits. After five or six months the child may return to his original diet, with the exception that he must eat sparingly of sweets and must eat nothing between meals. If the symptom-group returns on the addition of any article of diet, that particular food is to be permanently excluded from the diet.

During the attack the patient is to have all the outdoor air he can get with as little exercise as possible. As he recovers from his attack, exercise in the open air is advisable. During the attack, constipation should be relieved by some of the magnesium salts. Milk of magnesia or calcined magnesia are especially suitable for this purpose. Magnesium sulphate may be used in small doses in older children. Alkalies in the form of sodium bicarbonate, potassium bicarbonate or potassium citrate should be given in fair-sized doses, 5-grain capsules three or four times a day. In younger children who object to the taste of sodium bicarbonate direct the mother to distribute through the child's food a teaspoonful of this salt each day. Tincture of belladonna should be given for a short time in 2 to 4 minim doses three times a day. If constipation cannot be controlled by diet some form of cascara or other palatable laxative should be used as indicated. The belladonna is discontinued, but an alkali in some form should be given for six to eight weeks. Sodium bicarbonate is the best alkali for this purpose and may be given in moderate-sized doses once or twice a day.

Boston Medical and Surgical Journal

August 6, CLXXI, No. 6, pp. 217-252

- 19 Problem of Infection in Tuberculous Families. J. B. Hawes, Boston.
- 20 Summer Diarrheas. I. D. Steinhardt, New York.
- 21 Modern Treatment of Inebriety. I. H. Neff, Foxborough, Mass.
- 22 Occupation Therapy in Organic Diseases. H. J. Hall, Marblehead, Mass.
- 23 New Method of Treatment of Chronic Dacryocystitis. C. M. Cobb, Lynn, Mass.

Bulletin of Johns Hopkins Hospital, Baltimore

July, XXV, No. 28, pp. 195-222

- 24 *Involution of Uterus and Its Effect on Nitrogen Output of Urine. J. M. Slemmons, San Francisco.
- 25 *Normal Amount of Diastatic Ferment in Feces and Its Variation in Certain Diseases of Pancreas in Achylia Gastrica. T. R. Brown, Baltimore.
- 26 *Peripheral Origin of Surgical Shock. F. C. Mann, Indianapolis.
- 27 Normal Diastase-Content of Urine. T. R. Brown and C. W. Smith, Jr., Baltimore.

24. **Involution of Uterus and Effect on Nitrogen Output of Urine.**—As the results of Slemmons' investigations, it is apparent that the process of involution causes a rise in the urinary nitrogen and that the amount of excessive elimination corresponds to the nitrogenous content of the non-involved uterus. His observations offer confirmatory evidence of this fact from three points of view: First, by the comparison of the puerperal and postpuerperal periods when the uterus has not been removed; second, from the comparison of the aggregate excretion in cases in which the uterus was removed and in which it was not; and third, from the comparison of the actual daily difference in such cases with the theoretical amount of nitrogen which would be expected as a result of the involutionary process. Slemmons, therefore, concludes that waste products from the involuting uterus pass into the circulation, are excreted by the kidneys, and in some measure throw additional work on these organs during the early part of the puerperium.

It does not follow, however, that the diet should be restricted in the puerperium. On the contrary, Slemmons'

observations indicate that the increase in the excretion of nitrogen is not large enough to require such restriction, provided the patient is normal. If any therapeutic inference may be drawn, it is in the nature of a justification of the present-day tendency to allow a generous diet to recently delivered women. On the other hand, in patients suffering from toxemia of pregnancy, the additional work which the kidneys must perform in the puerperium does become a matter of practical importance. In such circumstances these organs should be given the fullest opportunity to recover from the strain to which they have been subjected, and, with this end in view, the diet should be limited. Such precaution is necessary not only because the renal cells have been damaged, but also because an excretory capacity somewhat greater than normal is desirable. The inspection of the urine-chart of a convalescent eclamptic teaches that in the days immediately following delivery the kidneys are eliminating an unusually large amount of waste products, even though the consumption of food is small. Formerly, the large nitrogenous excretion in such cases was attributed to the elimination of waste material which had previously been retained, and whose retention had caused the toxemia. Such a view is evidently incorrect, as Slemmons' observations show that the large excretion of nitrogen in these, as well as in normal cases, is due to the involution of the uterus.

25. **Diastatic Ferment in Feces in Certain Diseases of Pancreas.**—From Brown's study on the diastase content of feces in normal and in certain pathologic conditions the following conclusions are drawn: The stool, if a rigorously exact method is carried out as to food, purgative employed, preservation of specimen, estimation of ferment, etc., furnishes a diastase content within definite limits. The effect of waiting too long after the stool has been obtained before making the examination, the influence of variations in temperature in the place in which it is kept, and of different laxatives and different foods, is so great as to render results obtained by methods in which insistence on such a rigorous technic has not been made of much less value.

Extensive carcinoma of the pancreas showed no diastase in the tube of lowest dilution in Brown's method, and this absence of ferment should prove of great help in the diagnosis of this condition. In chronic pancreatitis diastase was present in the stool, but in markedly diminished amounts. In achylia gastrica the diastase content of the stool was practically normal in all the cases examined. This, in the first place, suggests that in the absence of hydrochloric acid some other method of pancreas activation is called into play, and, in the second place, that the diarrhea met with in certain of these cases of achylia gastrica—the so-called gastrogenous diarrhea—is not of pancreatic origin.

26. **Peripheral Origin of Surgical Shock.**—Mann found it impossible to reduce the anesthetized animal to a state of shock by any degree of sensory stimulation, provided all hemorrhage is prevented and its abdomen is not opened. He has been unable to show that acapnia is a primary factor in the production of shock. Shock is not due to disturbance of the respiration, but the respiratory center is more quickly injured than any other vital center by shock. The vasomotor center is not depressed nor fatigued in shock. It is the most resistant of all the vital centers. The peripheral and untraumatized visceral arteries are constricted in shock. Shock is not due to primary failure of the heart nor to involvement of the cardio-inhibitory or cardio-accelerator mechanism. It is possible to produce the signs of shock by the use of excessive heat or cold. The easiest and most certain method of producing shock is by exposure and traumatization of the abdominal viscera. This, judging from the literature, has been the method used by nearly all investigators of shock. Shock produced by exposure and trauma of the abdominal viscera is not due alone to a paralysis of the vasomotor mechanism of the splanchnic area.

The cause of shock, Mann says, is the tremendous loss of red cells and fluid from the blood, due to the reaction of the great delicate vascular splanchnic area to irritation—an acute inflammation of the peritoneum, due to trauma and

exposure to the air and changes of temperature. The great amount of this loss is apparent when it is taken into consideration that the peritoneum has an extent as great as the entire cutaneous surface of the body. The factors involved in their reaction to irritation are the same as those involved in any other local inflammatory process, and certainly do not involve the nervous system to any greater extent. The profound general effect is due to the actual loss of red cells and fluid from the circulating blood through stasis, diapedesis, exudate, endothelial changes, etc. In the course of operations in which the abdomen has not been opened, a loss of fluid and cells from the blood occurs. But the loss is, except when great areas of subcutaneous tissue have been exposed, comparatively unimportant.

Certain accessory factors which help to produce the condition of shock are muscular relaxation, decrease in intra-abdominal pressure and impaired respirations, all of which tend to decrease the amount of blood returned to the heart. The effect of chilling and the use of hot applications should be considered. Degenerative changes in the cells of the central nervous system are the result and not the cause of shock. General anesthesia of moderate depth prevents painful impulses from affecting the nerve cells of the central nervous system. Nerve blocking under such conditions is useless, so far as the prevention of shock is concerned. A relatively slight decrease in blood-supply may be sufficient to depress markedly the cells of the cerebral cortex. Care should therefore be taken to exclude this factor before ascribing such depression to inhibition.

Mann is of opinion that the use of word "shock" should be avoided, and instead an accurate and detailed description of the patient's condition should be given. If the term be used at all it should be applied to the condition in which, without any grossly discernible hemorrhage having occurred, the amount of circulatory fluid is greatly diminished on account of stagnation of the blood in the smaller veins and capillaries or by exudation of the fluid and cellular elements of the blood from the same.

Cleveland Medical Journal

July, XIII, No. 7, pp. 447-522

- 28 Occupational Neuroses—Pathogenesis and Examples of Treatment. T. A. Williams, Washington, D. C.
- 29 Ancestry of Homo Sapiens. T. W. Todd, Cleveland.
- 30 Medical Experiences in Korea. A. I. Ludlow, Seoul, Korea.
- 31 Temporo-Sphenoidal Abscess Secondary to Chronic Suppurative Otitis Media—Operation—Recovery—Radiograph Findings. J. M. Ingersoll, Cleveland.
- 32 Deaf Child and His Education. G. C. Burton, Cleveland.
- 33 Mating of Unfit. T. S. McWilliams, Cleveland.

Indiana State Medical Association Journal, Fort Wayne

July, VII, No. 7, pp. 309-356

- 34 Silent Areas of Brain; Report of Three Cases. B. Holmes, Chicago.
- 35 Treatment of Heterophoria and Heterotropia. F. A. Morrison, Indianapolis.
- 36 Symptomatology of Urethral Stricture. H. G. Hamer, Indianapolis.
- 37 Tuberculosis of Organs of Special Sense. W. C. Dyer, Evansville.

Journal of Medical Research, Boston

July, XXX, No. 3, pp. 261-540

- 38 *Coccidioides Immitis and Coccidioidal Granuloma. W. J. MacNeal and R. M. Taylor, New York.
- 39 *Effect of Quinin on Rabbits Inoculated with Rabies. L. Frothingham and J. Halliday, Boston.
- 40 Incidence and Inheritability of Spontaneous Tumors in Mice. M. Slye, Chicago.
- 41 *Anaphylaxis. R. Weil, New York.
- 42 Glomerular and Arterial Lesion Produced in Rabbit's Kidneys by Diphtheria Toxin. C. Frothingham, Jr., Boston.
- 43 Lipo-amlyoid Degeneration. O. Klotz, Pittsburgh.
- 44 Serum Cholesterol and Wassermann Reaction. P. G. Weston, Warren, Pa.
- 45 *Influence of Splenectomy of Certain Organs and Organ Extracts on Hemoposins of Blood Serum. H. T. Karsner, H. H. Amiral and A. V. Bock, New York.
- 46 *Experiments in Anaphylaxis with Lipoids of Tubercle Bacillus. B. White, Brooklyn.
- 47 *Staining of Yeasts by Gram's Method. A. T. Henrici, Minneapolis.

- 48 Tumors in Lungs of Mice. M. Slye, H. F. Holmes and H. G. Wells, Chicago.
- 49 Two "Atoxic" Strains of Diphtheria Bacilli. H. R. Brown and T. Smith, Boston.
- 50 Cholesterin—Heart Antigen Proposed by Walker and Swift. C. W. McClure, Iowa City, Ia.
- 51 *Reaction of Guinea-Pig to Virus of Typhus Fever. J. F. Anderson, Washington, D. C.
- 52 *Attempt to Immunize Guinea-Pig Against Tuberculosis by Use of Graduated, Repeated Doses of Living Tubercle Bacilli. L. Brown, F. H. Heise and S. A. Petroff, Saranac Lake, N. Y.
- 53 Classification of Streptococci. H. W. Lyall, Brooklyn.
- 54 *Hemolysin Production by Streptococci. H. W. Lyall, Brooklyn.
- 55 New Serum and Liver Substances as Levuloses in Trypanosomiasis. K. Schern, Ames, Ia.

38. **Coccidioidal Granuloma.**—Coccidioidal granuloma, according to MacNeal and Taylor, is a very definite specific infectious disease, subacute or chronic, and tending to a fatal issue. Twenty-four cases have been recognized in various parts of the western hemisphere, most of them in California. The disease has been observed almost exclusively in adult males. The histologic changes in the lesions very closely resemble those of tuberculosis. Differential diagnosis depends on finding the specific micro-organisms. *Coccidioides immitis* (Rixford and Gilchrist, 1896) is a well-characterized species of mold belonging to the Ascomycetes. In the animal body it exists as spheres enclosed in doubly contoured capsules and multiplies by endogenous spore formation. In aerobic cultures a septate mycelium is produced and in old cultures chlamdospores, which resemble somewhat the parasitic form of the organism. In anaerobic cultures in ascitic fluid of gelatinized horse-serum to which sterile tissue has been added, the parasitic forms continue to multiply for a time by endogenous spore formation, much as they do within the animal body.

Coccidioides immitis is distinctly different from the budding fungi found in human diseases variously called blastomycosis, oidiomycosis, Saccharomycosis or blastomycetic dermatitis, of which the budding parasite, *Cryptococcus dermatidis* (Gilchrist and Stokes, 1898), is perhaps the best known.

39. **Effect of Quinin on Rabbits.**—Neither quinin bisulphate nor quinin and urea hydrochlorid—dissolved in water and administered subcutaneously—had any curative effect on rabbits which showed symptoms of rabies after intracerebral subdural and intramuscular inoculation with street virus. Subcutaneous injections of quinin bisulphate and quinin and urea hydrochlorid caused a local reaction with necrosis and, in the control rabbits, subsequent sloughing.

41. **Anaphylaxis.**—When a guinea-pig is sensitized by the intraperitoneal injection of a large amount of the serum of a rabbit immunized against horse-serum, Weil states it becomes possible by Dale's method to determine the persistence of sensitization to horse-serum over a period of fifteen days. The degree of sensitization gradually diminishes. At the same time there is a gradual development of sensitization toward rabbit-serum. Coincidentally, the presence of circulating antibodies toward rabbit-serum is demonstrated in the serum by using it passively to sensitize normal guinea-pigs. These data are interpreted to indicate that both antigen (rabbit's serum), and antibody thereto, coexist for some time in the cells of a guinea-pig immunized by large doses of a foreign serum; and that the blood at the same time contains free antibodies. The suggestion is made that the persistence of antigen in the cell is a factor which contributes materially to the resistance of animals sensitized by massive doses of antigen.

45. **Influence of Splenectomy.**—Provided the spleen has been removed for a period of time less than a week and more than two days, the intravenous injection of a specific hemolytic immune serum, in doses large enough to produce hemoglobinuria, is followed by marked phagocytosis of erythrocytes by the endothelial cells of the lymph-nodes and liver. In the lymph-nodes the process starts about three hours after the injection of immune serum, reaches its height about twenty-four hours after the infection and is practically complete in forty-eight hours, when the endothelial cells are found to contain large quantities of pigment, presumably as the results of blood-destruction.

A study of hemopsonins of the blood-serum under the experimental conditions indicated in the text fails to show that the phagocytosis of erythrocytes, so prominent in the lymph-nodes of the splenectomized animal following a fairly large intravenous dose of specific hemolytic immune serum, is dependent on local or general variations in hemopsonin in the splenectomized animal as influenced by organ extracts of normal and of splenectomized animals.

46. **Experiments in Anaphylaxis.**—The cold alcohol soluble and hot alcohol soluble—cold alcohol insoluble constituents of three lots of virulent tubercle bacilli were prepared and tested by White for antigenic properties by the anaphylactic reaction. All the preparations when injected intraperitoneally into guinea-pigs in doses of from 0.025 gm. to 0.100 gm. failed to sensitize the animals to a subsequent, intravenous injection of from 0.75 to 2 cubic centimeters of an extract emulsion of the same strain of tubercle bacilli. (The minimum fatal dose of the extract emulsion was 0.3 cubic centimeter for an animal previously injected intraperitoneally with 0.5 cubic centimeter of a watery extract of tubercle bacilli.) None of the preparations when injected intravenously into guinea-pigs previously sensitized with tuberculo-protein produced any anaphylactic symptoms whatever. The intravenous injection of the lipid preparations in animals sensitized with tuberculo-protein produced no true anti-anaphylaxis to a subsequent intravenous injection of extract emulsion of tubercle bacilli. When the extract emulsion was injected one hour after the intravenous lipid injection a slight tolerance or refractoriness was noted, but no protection was observed when the second injection was delayed for nineteen to twenty days. None of the preparations sensitized animals to a subsequent injection of the corresponding lipid.

47. **Staining of Yeasts by Gram's Method.**—It is shown by Henrici that yeast cells retain Gram's stain more firmly than the common Gram-positive bacteria, and unlike the bacteria, the cytoplasm of the yeast cell is not homogeneous with regard to its ability to retain the stain, certain granules appearing in the decolorizing cell which hold the dye longer than others. It is suggested that the ability of these granules to resist decolorization is in direct proportion to their ability to resist autolysis.

51. **Reaction of Guinea-Pig to Typhus Virus.**—There apparently exists a natural immunity in the guinea-pig, similar to that found in the monkey, to typhus fever. In Anderson's experience of 4.7 per cent. of the guinea-pigs failed on first injection to react to an inoculation of proven virulent guinea-pig typhus-fever blood. Fifty-six per cent. of the guinea-pigs tested failed to react to a first injection of blood from human cases of typhus fever.

The passage of the virus of typhus fever through sixty-nine generations in the guinea-pig apparently produced no change in its virulence or infectivity for that animal. After sixty-nine passages through the guinea-pig the typhus-fever virus showed no apparent change in its infectivity for the monkey.

52. **Attempt to Immunize Guinea-Pig against Tuberculosis.**—The authors' experiments show that repeated doses of even virulent tubercle bacilli prolong the life of the animal far beyond that of the controls. They suggest that the explanation lies in the fact that the superinjection may be held for a time in abeyance by the presence of a slight active tuberculosis focus. It is probable from the autopsy findings that all the treated guinea-pigs would have eventually died from chronic tuberculosis.

54. **Hemolysin Production by Streptococci.**—Lyll maintains that the hemolytic titer does not afford any absolute criterion of virulence. The production of a potent hemolysin in both cultures is dependent on the nature and proportions of enriching substances, the reaction of the medium and the time of incubation. The hemolysin appears to be closely associated with the bacterial bodies and not to be in solution. The hemolysin does not appear to be in the nature of an enzyme. The hemolysin is destroyed by a temperature

of 56 C. for thirty minutes. It disappears within forty-eight hours at incubator temperature. Normal serums of sheep, guinea-pig, rabbit, cow and man contain appreciable amounts of antistreptolysin. Salvansanized serums possess a markedly increased inhibitory power on the hemolytic action of streptococci. Hemolysin production is inhibited by the addition of sugar. This occurs most uniformly in the case of dextrose. It does not appear to be definitely associated with the amount of acid produced.

Kentucky Medical Journal, Bowling Green

July, XII, No. 14, pp. 435-452

- 56 Milk. W. E. Gary, Louisville.
- 57 Management of Nephrolithiasis. H. H. Grant, Louisville.
- 58 Iiernia. G. P. Grigsby, Louisville.

Laryngoscope, St. Louis

July, XXIV, No. 7, pp. 645-708

- 59 Technic for Removal of Intrinsic Growths of Larynx. R. C. Lynch, New Orleans.
- 60 Laryngitis Submucosa Subglottica Acuta. C. W. Richardson, Washington, D. C.
- 61 Primary Sarcoma of Trachea. J. M. Ingersoll, Cleveland.
- 62 Use of Bronchoscope in Direct Examination of Larynx, Trachea, Bronchi and Esophagus. P. Schoonmaker, New York.
- 63 Bacterins in Treatment of Diseases of Nose and Throat. F. O. Lewis, Philadelphia.
- 64 Bacterins in Treatment of Diseases of Ear. G. M. Coates, Philadelphia.
- 65 Vaccine Treatment in Accessory Sinus Suppuration. R. H. Skillern, Philadelphia.

Maine Medical Association Journal, Portland

July, IV, No. 12, pp. 1925-1964

- 66 Medical Charity and Medical Legislation. W. C. Peters, Bangor.
- 67 Value of Social Service Work in Hospitals as Part of Efficient Diagnosis and Treatment. R. C. Cabot, Boston.
- 68 Twilight Sleep. H. E. Milliken, Portland.

Medical Record, New York

August 8, LXXXVI, No. 6, pp. 233-273

- 69 Intestinal Antisepsis Through Biologic Aids. B. Stow, New York.
- 70 Acute Contagious Conjunctivitis, Originating in a Public Swimming Pool. S. H. Brown, Philadelphia.
- 71 Aspects of Visual Acuity. H. M. Friedman, New York.
- 72 Physiology of Worry. E. D. Forrest, Boston.
- 73 *Medical Aspect of Athletics. R. E. Coughlin, Brooklyn.
- 74 *Acute Suppurative Otitis Media. H. L. Fifield, Syracuse, N. Y.
- 75 *Rhiniologic Aspect of Some Mental Disturbances. J. A. Hagemann, Pittsburgh.

73. **Medical Aspect of Athletics.**—It has been proved beyond question that immoderate college athletics lead to physiologic hypertrophy of the heart. Athletic training leads at first to physiologic hypertrophy, but when prolonged and marked by severer athletic contests, Coughlin says it usually leads to hypertrophy plus dilation of a variable degree, frequently marked by valvular insufficiency. Functionally the hypertrophied heart, even when dilated and giving distinct evidence of valvular insufficiency, may prove more fitted to carry the man through a severe athletic contest than a normal heart would be. On the other hand, acute cardiac dilation occurs more frequently in athletes and men used to severe muscular strain than in the normal man and the effects are more prolonged and severe. Carefully collected statistics show that deaths of athletes are caused by the following diseases in the order of their frequency: cardiac diseases, tuberculosis, typhoid fever, pneumonia and Bright's disease. The dangerous games indulged in with fatalities in the order of the greatest danger are said to be football, baseball and boxing.

75. **Rhiniologic Aspect of Some Mental Disturbances.**—A frequently unrecognized cause of mental depression, and sometimes suicide, in Hagemann's opinion, is empyema of the ethmoidal cells. The absence of a nasal outpouring may mislead one into making a negative diagnosis, although the patient is constantly or intermittently swallowing pus-bearing discharges which perhaps unnoticed trickle down the posterior pharyngeal wall. The consequent autointoxication from the biochemical products liberated in the intestinal tract establishes a neurasthenic condition characterized by great despondency. Whether a direct action on the cerebral

association-centers may be exerted by an ethmoidal sinusitis, Hagemann says, is problematic. The lymph currents all tend in the opposite direction. Yet one might picture to oneself the possibility of noxious fluids finding their way into the brain via the sheaths of afferent nerves.

Michigan State Medical Society Journal, Grand Rapids

August, XIII, No. 8, pp. 459-513

- 76 Treatment of Pernicious Vomiting of Pregnancy. F. W. Lynch, Chicago.
- 77 Hypo-epinephry. R. G. Leland, East Leroy.
- 78 Genito-Urinary Infections, More Especially Those Originating in the Kidneys. O. A. Hart, St. Johns.
- 79 West Indian Impressions. W. J. Stapleton, Jr., Detroit.
- 80 Fracture of Left Temporal Bone. J. T. Cooper, Muskegon.
- 81 Case of Appendicitis of Unusual Symptomatology. J. D. Matthews, Detroit.
- 82 Case of Otitic Streptococcal Bacteremia. R. B. Canfield, Ann Arbor.
- 83 Diagnosis of Diseases Associated with Enlargement of Spleen. J. J. Moffett, Port Huron.

New York Medical Journal

August 8, C, No. 6, pp. 253-300

- 84 Lanc's Auto-intoxication Complex and the Manifestations of Senility. I. L. Nascher, New York.
- 85 *Conservatism in Operative Treatment of Simple Fractures. G. Woolsey, New York.
- 86 Treatment of Diabetes Mellitus with Bacillus Bulgaricus. P. Horowitz, New York (to be continued).
- 87 Fractures of Upper End of Humerus (Analyses of 393 Cases). J. M. Hitzrot, New York.
- 88 Autoserum Treatment of Dermatoses. W. S. Gottheil, New York.
- 89 Gram Negative Streptococcus Pathogenic for Guinea-Pigs. J. G. Drennan, Roschank, S. I., N. Y.
- 90 Some Signs of Danger in Labor, and How to Meet Them. J. O. Arnold, Philadelphia.
- 91 Frederick Forchheimer. O. Juettner, Cincinnati.

85. Conservatism in Operative Treatment of Simple Fractures.—For guiding rules in the conservative operative treatment of fractures, Woolsey says: In recent simple fractures, do not operate unnecessarily, only after nonoperative treatment has been tried and failed, as no operative treatment is exempt from danger. Be most careful as to asepsis. Use the simplest thing that meets the indications and avoid large foreign bodies in the tissues when possible. Judge each case by itself. In properly selected cases the operative treatment of fractures greatly improves the results.

Old Dominion Journal of Medicine and Surgery, Richmond, Va.

July, XIX, No. 1, pp. 1-38

- 92 *Abnormal Arrangement of Branches of Aortic Arch. J. W. Brodnax, Richmond.
- 93 Treatment of Goiter and Hyperthyroidism. A. G. Brenizer, Charlotte, N. C.

92. Abnormal Arrangement of Branches of Aortic Arch.—In the subject reported by Brodnax the aortic arch was placed somewhat more to the left and on a higher level in the thorax than normal, reaching not quite to the supra-sternal notch. All of its branches arose by separate stems to the left of the median line, and in the following order; right common carotid, left common carotid, left subclavian, right subclavian. The right common carotid crossed obliquely in front of the trachea to gain the right side of the neck, in which it assumed its normal course; the left common carotid and subclavian occupied about their usual place; the right subclavian was the last branch of the arch, and was given off as low down as the body of the fourth thoracic vertebra, it then passed upward and to the right, behind the trachea and esophagus to gain its normal position in the interval between the scaleni muscles. The right vertebral was a product of the right common carotid. The branches of the thyroid axes, on both sides, arose by separate stems from their respective subclavian artery.

Vermont Medical Monthly, Burlington

July, XX, No. 7, pp. 177-198

- 94 Surgery of Large Intestine. E. M. Pond, Rutland.
- 95 Nurse in Private Practice Thirty-Three Years Ago and To-Day. J. B. Wheeler, Burlington.
- 96 Trained Nurse of To-Day. N. R. Bruce.

Tennessee State Medical Association Journal, Nashville

June, VII, No. 2, pp. 57-98

- 97 *Serum Diagnosis of Gonorrheal Infection. R. L. Jones and I. Simons, Nashville.
 - 98 *Drug Habit in Tennessee. L. P. Brown, Nashville.
 - 99 Chronic Appendicitis. R. A. Barr, Nashville.
 - 100 Etiology and Treatment of Corneal Ulcers. A. C. Lewis, Memphis.
 - 101 Placenta Praevia. J. S. Campbell, Gordonsville.
97. Abstracted in THE JOURNAL, May 16, p. 1583.
98. Abstracted in THE JOURNAL, May 2, p. 1427.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Tropical Medicine and Parasitology, London

July, VIII, No. 2, pp. 133-367

- 1 Entameba of Man in Panama Canal Zone. W. M. James.
- 2 Dysenteries in Canal Zone, with Special Reference to Amebic Dysentery. W. E. Deeks.
- 3 Emetine in Amebic Dysentery. W. E. Deeks.
- 4 Six Day Fever in Panama. W. E. Deeks.

British Medical Journal, London*

July 25, II, No. 2795, pp. 161-220

- 5 Serum Diagnosis of Pregnancy and of Cancer. A. Leitch.
- 6 Position of Country Doctor in 1879 and To-Morrow. J. L. Thomas.
- 7 Sprue. P. H. Bahr.
- 8 "Controlled" Use of New Tuberculin in Treatment of Pulmonary Tuberculosis. G. V. Stockdale and R. Hodson.
- 9 Sixty-Three Successive Cases of Enteric Fever Treated with Vaccines. W. P. MacArthur.
- 10 Hernia of Uterus, Vagina and Fallopian Tubes in a Boy (Germaphrodite). L. R. Braithwaite and W. Craig.

8. Tuberculin in Treatment of Tuberculosis.—As many cases as possible of pulmonary tuberculosis (the criterion for which was the presence of tubercle bacilli in the sputum) were collected by Stockdale and Hodson and paired off in such a way that a febrile patient was paired with another febrile, while an afebrile was paired with an afebrile. Then by lot it was decided which should be given tuberculin, so that there should be no suggestion as to picking cases. Further, as fresh patients were admitted into the hospital, it was decided by lot which should be given tuberculin and which should act as controls.

The tuberculin selected to be used was the new tuberculin residue (T. R.), and it was decided to give minute doses, increasing the doses gradually every second or third day at first and later at longer intervals in the case of the afebrile patients, while the febrile patients received a dose every fifth or seventh day. The initial dose in the former case was 1/100,000 milligram, and was increased to 2, 3, 5, 8 and 12/100,000 milligram, and then again about three-quarters as much again every dose. In the febrile cases the original dose was 1/200,000 milligram tuberculin residue. The object was to work up to the strength of tuberculin residue the patient would take without producing a reaction. When a reaction did occur the patient was kept quiet, and after a few days the same dose was repeated and if no reaction followed the treatment was continued as before. If, however, a reaction occurred a second time, then a further period of rest from tuberculin was given and was followed by a smaller dose than those which produced reaction. The maximum dose reached was 1/10 milligram, and this in the case of one patient only.

With regard to the local lesion, tuberculin seems to have done good in the afebrile cases, and such cases formed less than 30 per cent. of the total. Tuberculin was apparently harmful to the intermittently febrile patients, who formed the bulk of the series. Tuberculin had no apparent influence in increasing the weight or in improving the general condition, and in both these cases the balance of improvement is on the side of the controls.

Indian Journal of Medical Research, Calcutta

April, I, No. 4, pp. 589-794

- 11 Experimental Leishmaniasis in Monkey and Mouse Induced by Parasites in Culture. R. Row.
- 12 Production of Localized Lesion by Leishmania Donovanii in Macacus Sinicus. V. T. Korke.

- 13 Kala-Azar in Næwngong (Assam). F. P. Mackie.
- 14 Halteridium Parasite of Pigeon, Hemoproreus Columba, Celli and San Felice. H. W. Acton and R. Knowles.
- 15 Treatment of Swamps, Stream Beds, Ponds, Wells and Pools, with Destruction of Mosquito Larva. H. C. Wilson.
- 16 Malaria in Madras City. E. C. Hodgson.
- 17 Misleading Reactions Obtained with Precipitating Antisera and How to Avoid Them. W. D. Sutherland and G. C. Mitra.
- 18 *Standardization of Vaccines. H. C. Brown.
- 19 *Preparation and Standardization of Typhoid Vaccine. G. H. Blaker.
- 20 *Agglutination Reaction after Antityphoid Inoculation. A. W. Pyer.
- 21 Method of Estimating Amount of Gas Produced by Gas-Forming Bacteria. J. Cunningham.
- 22 Filariasis in Cochin. J. A. Cruickshank and R. E. Wright.

18. **Standardization of Vaccines.**—The weight of bacteria in the dry condition according to Brown is the most satisfactory measure of quantity which we possess. The weight of bacteria in the moist state is much more influenced by extraneous, not always easily controlled, conditions, such as humidity, than is the weight of bacteria dry. Comparison of weights moist is not, therefore, to be recommended as a method of standardization. If a preliminary determination of the relation of weights moist and dry be made, then the weight moist may be taken for the subsequent manipulations required for the preparation of standard suspensions of bacteria such as are used in bacteriologic technic (agglutination, opsonic index, etc.), and for preparation of vaccines. If weight of bacteria is the most satisfactory standard of quantity available it is essential that vaccines should have their dosage expressed in terms of weight. Methods of standardization by enumeration are best carried out with suspensions of moist, young, actively growing bacteria (1) because the enumeration by colony count demands that all the bacteria used should be living, (2) because suspensions in the ordinary media used are most easily made in this way. Brown's experiments indicated that there was no loss of antigenic power during desiccation. As a method of enumeration Braxton Hick's procedure with standardized suspensions of organisms was found to be satisfactory.

Brown's method, in which an acid-fast organism was used, dispensed with the need for two standard suspensions and gave better staining results. It is necessary to ensure the adhesions (as e. g., by use of an albumin solution) of the bacteria in such standard suspensions to the slide surface, otherwise the values obtained will vary very considerably. Determination of quantity by an opacity method is easily carried out by contrasting the test suspension with specially prepared standard suspensions in tubes of equal caliber. A special instrument such as a colorimeter makes the determination still easier.

19. **Preparation of Typhoid Vaccines.**—Blaker found that the growth obtained in broth sterilized in a Koch's sterilizer is more vigorous than that in broth sterilized in an autoclave. After forty-eight hours of incubation there is evidence of commencing death of bacilli, as is evident from the plate culture method of enumeration and microscopic examination. Blaker says that the plate culture method of standardization should not be applied to a broth vaccine grown for longer than forty-eight hours as it would show too low a bacillary content. Although by means of Wright's method of enumeration standardization can be effected, even after forty-eight hours' incubation, the increasing autolysis which takes place after this period renders it doubtful whether growth should be allowed to go on longer. If allowed to do so, the accuracy of the standardization is liable to be affected.

20. **Reaction of Typhoid Inoculation.**—Of 143 patients inoculated more than nine months previously only 21 gave agglutination reactions in a dilution above one in 16, and of these 20 agglutinated in no higher dilution than one in 20. In a patient, previously inoculated against typhoid at an interval of not less than six months, a positive typhoid agglutination reaction in higher dilution than one in 40 indicates the probability of the disease from which the patient suffers being typhoid.

Indian Medical Gazette, Calcutta

July, XLIX, No. 7, pp. 253-296

- 23 Fatal Case of Ophithoxemia. F. Wall.
- 24 Cocain Eaters of Bombay. A. W. Tuke.
- 25 Plague Jottings. F. P. Connor.
- 26 Osseous New Growths at Elbow Joint Following Injuries to Joint —Not Necessarily Dislocations. J. A. Shorten.
- 27 Three Cases Illustrating Unusual Sequela of Malarial Fever Due to Plasmodium Falciparum. R. Dowden.
- 28 Treatment of Uncomplicated Retroversion of Uterus by Sling Operation. T. B. Hance.
- 29 Nature of Jail Dysentery. L. B. Scott.
- 30 Treatment of Cholera by Exhibition of Chlorhydrate of Emetine in Hypodermic Injections. Renault.
- 31 Case of Pulmonary Tuberculosis Treated with Tuberculin. G. C. Chatterjee.
- 32 Two Cases of Transposition of Viscera. B. P. Daruvala.

Journal of Tropical Medicine and Hygiene, London

July 15, XVII, No. 14, pp. 209-224

- 33 Ankylostomiasis in North Nyasa District. A. G. Eldred.

Lancet, London

July 25, II, No. 4743, pp. 207-280

- 34 Localization of Motor and Speech Centers in Definite Areas of Cortex and Brain. E. Dupuy.
- 35 *Reduction in Virulence of Tubercle Bacilli Stored in Normal Saline. L. S. Dudgeon.
- 36 Observations of One Hundred and Twenty Cases of Lead Absorption from Drinking-Water. W. W. Stainthorpe.
- 37 Celluloid Splints in Treatment of Acute Cases of Poliomyelitis. F. E. Batten.
- 38 Epidemic Catarrhal Jaundice. E. A. Cockayne.
- 39 *Problems in Cardiac Physiology. A. F. S. Kent.
- 40 Case of Tuberculous Disease of Vertebra. J. Miller and A. F. Hewat.
- 41 *Surgical Treatment of Streptococcal Arthritis. J. O'Connor.
- 42 Technic of Abderhalden's Serum Reaction. W. E. Bullock.
- 43 *Geographic Distribution of Appendicitis. R. W. Murray.

35. **Tubercle Bacilli in Normal Saline.**—Certain experiments are cited by Dudgeon which show the effect of storage on the pathogenicity of the tubercle bacillus. There was a gradual reduction of the pathogenicity of the bacillus stored in normal saline. No attempts were made, however, to sub-cultivate the stored bacillus direct from the saline bacillary mixture.

39. Published in the *British Medical Journal*, July 18, and abstracted in *THE JOURNAL*, August 15, p. 609.

41. **Treatment of Streptococcal Arthritis.**—O'Connor makes it a rule to operate on patients who do not promptly yield to medical treatment (sodium salicylate 3ss., sodium bicarbonate 3j., three-hourly; salines, milk diet, woolen clothing, etc.). All infected joints are opened, flaky turbid lymph is evacuated, free irrigation with warm oxygen water, drainage tubes inserted and retained *in situ* for three days. Multiple incisions are made into areas of periarticular cellulitis and not mercurial fomentations applied. Splints are employed for immobilization purposes for from seven to ten days, at the end of which the patient is requested to commence graduated active moment. When wounds are healed gentle massage is prescribed.

43. **Geographic Distribution of Appendicitis.**—Murray claims that diet is a very important factor, probably the important factor, in the etiology of appendicitis. As this disease prevails among meat-eating nations it is further probable that the view of the late Dr. Williams is the correct one, namely, that the most important constituents in our food predisposing to appendicitis are the saturated fats, such as are contained in beef and mutton. Apart from the question of diet, other contributory causes have to be considered. Irregular meals, the "quick lunch," and imperfect teeth all play their part, and the general want of physical exercise is very noticeable.

Quarterly Journal of Medicine, London

July, VII, No. 28, pp. 325-495

- 44 *Aggressins in Appendicitis and Other Varieties of Peritonitis. A. D. Gardner.
- 45 *Leukemias: Analysis of Fifty-Nine Consecutive Cases. P. N. Pantou, H. L. Tidy and G. H. Pearson.
- 46 *Fragility of Red Blood-Corpuscles in Physiologic and Pathologic States. A. D. Bigland.

- 47 Case of Prolonged Cheyne-Stokes Breathing (Twenty-One Weeks). W. H. White, J. H. Ryffel, E. P. Poulton, W. Johnson and R. A. Chisolm.
- 48 Importance of Functional Activity in Etiology of Nervous Diseases. W. Johnson.
- 49 Blood-Pressure Estimations in Disease by Oscillatory and Auditory Methods. G. S. Melvin and J. R. Murray.
- 50 Formation of *B*-Iminazolyethylamine in Ileum of Certain Constipated Subjects. Urine in Constipation. N. Mutch.
- 51 Family Cerebral Degeneration with Macular Change (So-Called Juvenile Form of Family Amaurotic Idiocy). F. E. Batten.
- 52 Diagnosis of Pancreatic Disease. A. F. S. Sladden.

44. **Aggressins in Appendicitis and Peritonitis.**—A considerable number of peritoneal exudates were tested by Gardner for aggressive action (inhibition of phagocytosis *in vitro*). Inasmuch as aggressiveness is the direct consequence of a profuse multiplication of bacteria, the greater the number of bacteria, the more likely is the fluid to act aggressively. Early exudates therefore (first twenty-four hours) are never aggressive. Gardner found that aggressive substances are nearly always present in pus from appendicular abscesses, and they do no harm so long as the abscess wall remains intact. But they may play an important and dangerous part when a channel of communication is formed between the abscess cavity and the general peritoneum. In spreading or already diffuse peritonitis, the formation of aggressive bodies signifying as it does bacterial activity, marks the onset of a graver stage of infection. A consideration of aggressins, their origin and their action, suggests that a discriminating use of bactericidal chemicals may be of great value in the surgical treatment of peritonitis. Ether and colloidal silver are two such bodies which have undergone a successful trial.

Any exudate found in the peritoneal cavity in gangrenous or perforative appendicular peritonitis may be aggressive, unless it is very recent (twenty-four to thirty-six hours), when it is very unlikely to show any aggression, or it is quite clear and transparent, in which case it is never found to be aggressive. Thick, offensive pus is nearly always aggressive, and usually to a high degree. Appendicular abscesses in the vast majority of cases contain markedly aggressive pus. The presence of a strongly aggressive exudate in the general peritoneal cavity is a great danger to the patient. In the treatment of several varieties of peritonitis, Gardner states, closer attention might with advantage be paid to the question of bacterial multiplication, and to the direct means which are open to the surgeon of checking it. Local chemotherapy by means of drugs which kill or paralyze bacteria without damaging to any considerable degree the living body-cells, Gardner says, is not only possible, but has been proved in practice to be at least worthy of a more extensive trial.

45. **Leukemias.**—Of 59 consecutive cases of leukemia studied by Tidy and Pantou, 16 were classed as acute myeloid, 29 as chronic myeloid, 8 as acute lymphoid leukemia, and 6 as chronic lymphoid. It was evident that the clinical picture of leukemia varies with the acuteness or chronicity of the disease, and not with the lymphoid or myeloid origin of the cells. Acute lymphoid and acute myeloid leukemia are clinically indistinguishable, and so may be chronic lymphoid and chronic myeloid leukemia. Acute lymphoid leukemia has little resemblance to chronic lymphoid, nor acute myeloid to chronic myeloid, except in so far as chronic myeloid may terminate by a condition similar to the acute disease. One can distinguish by a blood examination between the acute and chronic types of myeloid leukemia, but not between acute and chronic lymphoid leukemia. The latter diseases are readily distinguished on clinical grounds. Acute myeloid and acute lymphoid leukemia can be distinguished by the type of cell present, but the conditions have been frequently confused and the clinical course is the same. The confusion has been due to a failure to distinguish between myeloblasts and lymphocytes. The differentiation is rarely if ever difficult for those accustomed to the use of Leishman's or other similar stains. In this connection the authors have found oxydase reaction to be quite useless. In no case in the authors' experience has the myeloid type of cell been replaced by the lymphoid type, or vice versa.

The effect of treatment in the acute cases has been negligible. In the chronic lymphoid cases changes have been extremely slight. In the chronic myeloid cases, some have changed little, others have changed to a remarkable degree. Those cases which have fluctuated to the greatest extent have been the youngest subjects. The blood of patients over the middle age reacts but little. There has been no instance of purpura in either of the chronic leukemias. In those cases of acute leukemia associated with purpura the spleen was invariably enlarged. Infiltrations of the skin, painful bones, and priapism occurred in no case. Oral sepsis did not appear to have any bearing on any type of the disease. The cases of acute myeloid leukemia include an interesting group of four patients whose predominant blood-cell was a so-called Rieder cell. This cell Tidy and Pantou believe to be a large hyaline, partly on morphologic grounds, since the cell may be indistinguishable from the large hyaline of normal blood, and intermediate types between the normal cell and the primitive marrow-cell were numerous; partly on functional grounds, because these cells were actively phagocytic, as are those of the normal blood. They consider that a scrutiny of these cases affords strong evidence of the marrow origin of the large hyaline cell.

46. **Fragility of Red Blood-Corpuscles.**—A method is described by Bigland of accurately and easily determining the fragility of red blood-corpuscles toward the hemolyzing agent saponin. Human red blood-corpuscles show a constant figure of resistance toward saponin hemolysis. The serum is markedly protective against the action of saponin, but this power varies within certain limits. The corpuscles of various animals show marked variation in their fragility. In jaundice the resistance of the washed red blood-corpuscles is markedly diminished, while the protective action of the serum is markedly increased. This latter result is not due only to the antagonistic action of saponin and bile salts. In all the anemias, except pernicious anemia, the corpuscular resistance is increased. In pernicious anemia it is normal or slightly diminished. In splenic anemia there is great increase in corpuscular resistance, and the serum appears to have no protective reaction. In the anemia found in malignant disease, syphilis, tuberculosis, scurvy, amyloid disease and myelogenous leukemia, and in a case of splenectomy, there was an increased corpuscular resistance. In diabetes the corpuscular fragility is normal, while the serum in some cases is abnormally protective. In exophthalmic goiter and paroxysmal hemoglobinuria the corpuscular fragility is normal. In polycythemia the resistance is increased. A high temperature appears to increase corpuscular fragility.

Sei-I-Kwai Medical Journal, Tokyo

July, XXXIII, No. 27, pp. 39-43

- 53 Chief Symptoms and Signs of Acute Appendicitis. Y. Takaki.

Archives Mens. d'Obst. et de Gynéc., Paris

June, III, No. 6, pp. 513-602

- 54 The Thorax in the New-Born. E. Maurel.

Journal de Médecine de Bordeaux

LXXXV, Nos. 26-28, pp. 437-482

- 55 *Meningeal Symptoms in Scarlet Fever and Scarlatinal Uremia. P. Mauriac and P. Philip.
- 56 Multiple Skin Abscesses Due to Sporothrix; Two Cases. F. Bonnel, Verdet, Petges and Lasserre.
- 57 Sunshine and Sea Air in Treatment of Surgical Tuberculosis. J. Doche.
- 58 *Hemorrhagic Effusion in Pleurisy. Creyx.

55. **Meningeal Symptoms in Scarlet Fever.**—Mauriac and Philip report the case of a child with unsuspected scarlet fever who suddenly developed epileptiform convulsions from severe uremia affecting the central nervous system. Under treatment the condition improved, the child roused and the temperature returned to normal, but the third day it ran up again and the child died in coma. Pneumococci were cultivated from the cerebrospinal fluid and there was a high urica content as also in the blood. In a second case the mild scarlet fever without albuminuria had been properly treated

but during convalescence the girl of 15 got chilled one evening and fulminating subacute nephritis with pulmonary edema followed and soon proved fatal. The extreme gravity of abortive, unrecognized forms of scarlet fever and the complexity of scarlatinal and uremic meningeal conditions are emphasized by these cases and some others cited. There were none of the signs of actual meningitis, no Kernig, no stiff neck, no vomiting; the convulsions dominated the clinical picture. The meninges evidently suffer in scarlet fever and one must be on the lookout for superposed acute infection. The prognosis otherwise depends on the degree of the retention of urea. A high temperature accompanying the convulsions suggests superposed infection.

58. **Hemorrhagic Pleurisy.**—Creyx says that when the effusion is hemorrhagic, clots may form and impede the escape of fluid when the puncture is made at the lowest point, which otherwise is the preferable technic.

Presse Médicale, Paris

July 18, XXII, No. 57, pp. 545-556

- 59 Technic for Intravenous Injection of Neosalvarsan with Small Amount of Vehicle. P. Le Damany.
60 Renaissance of Scientific Study of Mineral Waters. (Pouvoir catalytique des eaux minérales; leur richesse plurimétallique.) R. Glénard.

Revue de Chirurgie, Paris

July 10, XXXIV, No. 7, pp. 1-136

- 61 *Correction of Contracture of Fingers. M. H. Morestin.
62 *Retroduodenal Operation for Calculi in the Pancreas. (Lithiase pancréatique.) Lacouture and Charbonnel.
63 *Snapping Joints. (Les articulations à ressort; Subluxations volontaires intermittentes des articulations.) P. Bertein. Commenced in No. 5.

61. **Treatment of Deformed Fingers.**—Morestin refers to fingers permanently contracted as the result of some pathologic process in them or in the vicinity. Treatment is as simple as it is effectual when all the obstacles preventing the use of the finger are cut away in turn, the scar tissue, the debris of tendon sheaths, the muscles and the shriveled ligaments, passing systematically with minute care from one to the other until all that interferes with the straightening of the finger is done away with. The triangular or square flaps cut to alternate and turn back for access to the deeper soft parts, can be brought back to cover the defect, utilizing also the cicatricial tissue that has been binding down the finger, and the result is quite satisfactory, much more than would be anticipated. He has found it possible in this way to restore practically complete function to a thumb, for instance, left absolutely crippled after an abscess or other lesion. He makes no attempt to restore the tendons. The fingers can serve very useful purposes without the tendons; the muscles of the thumb suffice to bend it, and a finger once rendered flexible bends with the others. All his patients had the wage-earning power of the hand restored. He gives an illustrated description of five peculiarly striking cases.

62. **Calculus in the Pancreas.**—Lacouture and Charbonnel report a case in which a calculus was successfully removed from the pancreas, which was opened back of the duodenum. They have found only 133 cases of pancreatic lithiasis on record, including 16 in which operative treatment was applied. In their case roentgenoscopy later showed that the woman of 32 still has five very small calculi left in the pancreas. Although she feels well except for slight pain under the right costal arch, yet she is kept on a diet free from meat and fat in order to spare the pancreas as much as possible. In 5 of the 16 operative cases the stone could not be found and 3 of the patients died, as also 2 others requiring extremely complicated operations. The mortality was thus 34 per cent.; and 1 patient died several years later from pancreatic diabetes. The final outcome otherwise is not known except in 3 cases in which the patients were in good health after from four to fourteen months.

63. **Snapping Joints.**—No cutting is required as a rule to correct this tendency to volitional, intermittent subluxation in a joint. A plaster cast will hold the parts in place and

give the stretched capsule a chance to retract and put an end to the abnormal play of the parts. Afterward the joint should be kept from overuse.

Revue Mens. de Gyn., d'Obstét. et de Pédiatrie, Paris

June, IX, No. 6, pp. 367-427

- 64 Tardy Fistula after Cesarean Section; Two Cases. A. Grosse.
65 Cystic Degeneration of Ovary with Hydatidiform Mole; Author's Fifth Case. G. Calderini.
66 Third Cesarean Section at Term in Three Years; Twins. R. Gilles.

Semaine Médicale, Paris

July 15, XXXIV, No. 28, pp. 325-336

- 67 Comparative Test Elimination of Iodin and Lactose in Various Types of Nephritis. F. Widal and P. V. Radot.

Archiv für klinische Chirurgie, Berlin

CV, No. 1, pp. 1-276. Last indexed July 25, p. 357

- 68 *Transplanted Connective Tissue. (Das cutane und subcutane Bindegewebe in veränderter Funktion.) E. Rehn and Miyauchi.
69 *Disturbances and Dangers from Cystic Goiter. (Kropfcysten.) Riedel.
70 *Tying Off the Pylorus. (Ergebnisse der Pylorusausschaltung durch Fadenumschnürung.) N. Guleke.
71 *Resection of Gastric Ulcer. (Resektion des Magens bei Magengeschwür.) G. Perthes.
72 *Cause and Treatment of Postoperative Abdominal Hernia. (Bauchbrüche.) Sprengel.
73 Stab Wounds of the Brain through Base of Skull. (Stichwunden des Gehirns von der Schädelbasis aus.) S. Solieri.
74 *Total Peripheral Anesthesia" after Intravenous Injection of Local Anesthetics. A. W. Meyer.
75 Primary Resection of Large Intestine. (Dickdarmresektion.) R. von Rauchenbichler.
76 Connection between Disease in the Appendix, the Cecum and the Sigmoid Flexure. (Beziehungen der Erkrankungen des Wurmfortsatzes zu denen des Coecums und S. Romanum.) E. Opitz.
77 Operative Reduction of Old Dislocation of the Elbow, with or without Fracture. P. R. von Walzel.
78 *Postoperative Necrosis of the Pancreas. Jenckel.

68. **Transplanted Connective Tissue.**—Rehn and Miyauchi give an account of their experimental research with skin and subcutaneous connective tissue used to substitute tendons, ligaments, etc., and fourteen clinical cases in which the method was successfully applied. Whether used as a twisted cord or flat sheet, it healed always in place without signs of irritation and answered its purpose perfectly either as a tendon, a ring to reenforce a sphincter, or a broad strengthening band. It seemed to answer the purpose fully as well as fascia or tendon flaps.

69. **Cystic Goiters.**—Riedel states that among the 1,075 patients who were operated on for goiter in his service, large cysts were found in the thyroid in 148. He here discusses the disturbances and dangers to which a tendency to such cysts exposes the patient.

70. **Tying off the Pylorus.**—Guleke has recently reexamined nearly all of the thirteen patients who required exclusion of the pylorus; this had been done by ligating it with silk. Two died in a few weeks from preexisting complications. The others were found all in good condition, the pylorus still completely shut off. He does not regard this method of ligating the pylorus as superior to others but his experience indicates that it is feasible and gives good results when special circumstances render it necessary to hasten the operation and bring the patient out from under the anesthetic. The eleven cases are reported in detail.

71. **Resection of the Stomach for Ulcer.**—Perthes reports that among 40 operations of the kind, the 18 patients treated by transverse resection all made a smooth recovery, while 2 died of the 17 with resection of the pylorus for a hard ulcer and one after resection of the middle half of the stomach. He has learned that 2 of the 11 patients with hard ulcer have died since from cancer, and this is probable also in a third fatal case. Even the resection did not save these patients.

All the other patients are in excellent condition and have gained materially in weight. Some complain of an insatiable appetite; they are ready to eat at all hours of the day, but not much at a time. Roentgenoscopy has explained this as due to the abnormally rapid emptying of the stomach after

food is taken; the stomach being more of a straight tube, the food passes rapidly along and the lack of gastric digestion has to be made up by more frequent meals. The pylorus gapes all the time in these cases. These findings were obtained only in certain cases; in others the appetite seemed to be normal and roentgenoscopy showed that the food remained the usual time in the stomach. The secretion of gastric juice, however, was materially reduced in both classes of patients. The excellent general condition shows that the bowels are able to compensate for the deficiency in gastric digestion.

72. Postoperative Ventral Hernia.—Sprengel's article was the address to open the discussion on this subject at the last German Surgical Congress. It is illustrated and closes with the warning that the danger of postoperative hernia depends on the mode of the incision and its location; the upper abdomen is less liable to it than the lower. The principle of alternating and transverse incisions is unmistakably superior to the single incision. There is still uncertainty as to the best technic further, but there seem to be no reasons for prophylactic plastic operations to ward off ventral hernia. He does not approve of using an autotransplant of muscle tissue to correct a postoperative abdominal hernia, preferring an unpedunculated fascia flap for the purpose. Paralysis of the abdominal walls and extensive stretching of the side walls of the abdomen must be regarded at present as beyond hope of a cure.

74. Total Peripheral Anesthesia from Intravenous Injection of Local Anesthetic.—Meyer made an intravenous injection of cocaine in dogs and cats and gives the details of twelve such experiments. The injection was preceded by a little morphin and scopolamin, and the results confirmed those published by Meltzer, Kast and Ritter in regard to the total peripheral analgesia thus induced. Even the peritoneum seemed to be totally free from sensibility. Contact was evidently felt but no pain. The analgesia seemed to be restricted to the periphery; the peripheral nerve terminals to which the anesthetic is brought by the blood feel the effects while the nerve trunks escape.

78. Postoperative Necrosis of the Pancreas.—Jenckel states that he has had 11 cases of acute or subacute necrosis of the pancreas in his service in the last three years, and in two instances the necrosis had followed on an operation. In one of these latter cases the operation had been the removal of a cancer in the sigmoid flexure in a man of 56; in the other case a large ovarian cyst had been removed from a woman of 64. There had been nothing previously to suggest any pancreas trouble, and the acute necrosis developed soon after the operation and proved fatal the sixth and sixteenth days. He is inclined to ascribe the necrotic process to the resection of the omentum which had been required in each of the cases. Retrograde embolism followed, and this injured the pancreas tissue and started the autolysis.

Centralblatt für die Grenzgebiete der Med. und Chir., Jena

July, XVIII, No. 4, pp. 319-390

79 *Thorax Surgery and Differential Atmospheric Procedures. (Thoraxchirurgie und Druckdifferenzverfahren.) F. Steinmann.

80 *Iodine and Exophthalmic Goiter. (Basedow und Jodbasedow und deren Zusammenhang mit dem System der Drüsen mit innerer Sekretion.) A. Kempner.

81 *Reflex Epilepsy and Its Operative Treatment. S. Kalischer.

79. Thorax Surgery and Differential Pressure.—Steinmann lists 221 articles bearing on this subject and compares the experiences and views of the various writers with his own clinical work. He expatiates on the great value and importance of the differential-pressure procedures not only as an almost indispensable aid in operations on the thorax, but as also of service in revealing a wound in the lung by the air streaming through it, in locating foreign bodies, and in facilitating ligation or gentle clamping to expel the blood from a lobe. Another great advantage is that the suction of air aspirates out blood, mucus and pus in opening an abscess or other cavity in the lung. This is found extremely useful often in changing the dressings. Küttner made an

opening into a bronchus in a case of deep stenosis of the trachea, thus permitting retrograde respiration. Differential pressure is also of great service in operating on the heart; in fully 80 per cent. of all wounds of the heart the pleura is injured likewise. Exploratory thoracotomy under differential pressure is now a routine measure, and by alternating positive and negative differential pressure, artificial respiration can easily be kept up indefinitely.

80. Iodine and Exophthalmic Goiter.—Kempner concludes from the literature on this subject that there can be no doubt that iodine, even in minute doses, is liable to elicit Basedow symptoms in persons with a goiter. The evidence further shows that true Basedow may develop from an acute thyroiditis. Three authors have published cases in which patients with clinically normal thyroids developed Basedow symptoms while taking iodine for arteriosclerosis, tabes or a false tumor in the brain. Romheld and Pineles have noticed a connection between an iodine-Basedow and an inherited taint such as diabetes, obesity, Basedow or neuropathy. This confirms anew the close connection between the iodine-Basedow and other glands with an internal secretion as well as the thyroid; possibly the Abderhalden reaction might throw light in these cases. Ohlemann does not agree with other writers on this subject; he states that exophthalmic goiter was favorably influenced in his own person by 10 or 20 drops daily of a $\frac{1}{3}$ solution of potassium iodide, kept up for six weeks; his pulse-rate dropped by 68 beats. Later, he took 2 to 4 drops of tincture of iodine (P. G.), his pulse going down to 72 in ten days and the improvement persisting for ten months after this treatment. He thinks that too large doses are responsible for the unfavorable effects experienced by others.

Kempner warns that a family predisposition to goiter, Basedow and aneurysm of the aorta is sometimes evident, and calls for special caution in giving iodine. Kienböck found the thyroid slightly enlarged in nearly every case of dilatation or aneurysm of the aorta in men, and noted signs of hyperfunctioning on the part of the thyroid in most of the cases. He explains the tendency to goiter in these cases as the result of venous congestion from the pressure of the enlarged aorta. It is possible however that the thyroid may have become enlarged under the influence of preceding iodine treatment, or that both the thyroid symptoms and the aorta affection can be referred to a common cause, some upset in the ductless-gland system.

81. Reflex Epilepsy.—Kalischer applies this term to cases in which the epileptic seizure is a reflex reaction to peripheral irritation. His analysis of eighty-four articles published on the subject shows that in a large number of cases hysteria alone can be incriminated; in others the trauma was merely a contributing factor with a predisposition. At the same time there are cases on record in which lesions of the skin, mucosa, bones and meninges were evidently responsible for the epilepsy, and the latter was cured by appropriate treatment of the peripheral lesion. An interval of five years at least must be required before speaking of an absolute cure.

Correspondenz-Blatt für Schweizer Aerzte, Basel

July 4, XLIV, No. 27, pp. 833-864

82 *Pernicious Anemia in Children. M. Kusunoki.

83 Mechanical Treatment of Tuberculous Lung. (Zur intra- u. extrapleurale Collapstherapie bei Lungenphthise.) W. Knoll.

82. Pernicious Anemia in Children.—Kusunoki reports from Basel the case of a girl of 6 with anemia of unknown cause. The color-index was high, the reds dropped from 1,868,000 to 510,000 and the hemoglobin from 40 to 10 per cent. in the course of five weeks. The presence of megaloblasts and megalocytes, absence of leukocytosis, the tendency to hemorrhages and all the histologic findings testified to true pernicious anemia. Several lymph-nodes were swollen but this is of such common occurrence in children that it can be disregarded in the diagnosis. Streptococci were cultivated from the tonsils. He reviews the few cases on record of pernicious anemia in young children, remarking that some of them evidently belong in other categories.

Deutsches Archiv für klinische Medizin, Leipzig

CXV, Nos. 5-6, pp. 399-638. Last indexed Aug. 1, p. 435

- 84 Composition of the Air in Pneumothorax. F. Tobiesen.
85 Ferments of the Sputum. (Chemie des Sputums. II.) E. Maliwa.
86 Adhesive Pericarditis and Disappearance of the Normal Lateral Vertical Change of Position in the Heart on Changing from a Lying to a Standing Position. W. Achelis.
87 Oxidation of Sugar in Pancreatic Diabetes. M. Landsberg.
88 Carcinomatous Meningitis. (Ueber latentem Meningealkrebs.) H. Eichhorst.
89 Heart Disturbances after Pneumonia. J. Zadek.
90 Analysis of the Mechanical Work of the Heart. (Dynamik des Säugetierherzens.) H. Straub.
91 The Leukocyte Count in Miliary Tuberculosis and Its Value in Diagnosis. P. Wack.
92 Paradoxical Pulse. M. Semerau.
93 Effect of Human Serum in Scarlet Fever not due to Lipoids. (Scharlachbehandlung mit Humanserum und Serumlipoiden.) W. Schultz.

91. The Leukocyte Count in Miliary Tuberculosis.—Wack declares that in miliary tuberculosis there is a relative decrease in the lymphocytes. This is found in cases in which there is no secondary affection, showing it to be due to the tubercle bacilli alone. There is a temporary decrease in the total leukocyte count in many cases. This is of value in the differential diagnosis from typhoid, purulent meningitis and pulmonary tuberculosis. A case is described that showed the clinical and hematologic picture of acute myeloid leukemia. Autopsy revealed subacute miliary tuberculosis. Roth believes that the miliary tuberculosis was the cause of the myeloid leukemia. Several similar cases have been described in the literature. The severity of the infection causes an early interference with the function of the bone-marrow, so that immature forms of cells are discharged into the blood.

Medizinische Klinik, Berlin

July 26, X, No. 30, pp. 1255-1298

- 94 Hygiene of Voice and Speech. (Stimme und Sprache.) E. Fröschels.
95 Serodiagnosis in Nervous and Mental Diseases. H. Neue. Commenced in No. 29.
96 Treatment of Fresh Gonorrhea. (Eine Behandlungsmethode des frischen Trippers der Männer.) L. Merk.
97 Congenital Myxedema and Thyroid Treatment. (Thyreoplasie und ihre Therapie.) W. Schemensky.
98 Etiology and Vaccine Therapy of Ozena. J. Safranek.
99 Heat as Factor in Balneology. (Anteil der Badewärme an den therapeutischen Erfolgen der Solbäder.) Jeddeloh.
100 Benefits of Early Treatment Seen in Workings of Workman's Compensation Laws. (Zur Frühübernahme des Heilverfahrens.) P. Zander.
101 Insufficiency of Bladder Sphincter in Women. (Blasenschwäche des Weibes.) B. Hirschfeld.
102 Protective Ferments in Urine. (Nachweis von sogenannten Abwehrfermenten im Urin.) V. Kafka.
103 Action of Carbonated Baths on the Circulation. (Zur Frage der Kreislaufwirkung kohlensäurehaltiger Solbäder.) O. Müller.

96. Treatment of Recently Acquired Gonorrhea.—Merk gives the patient a set of vials each containing a mixture of 0.03 gm. silver nitrate and 0.025 gm. potassium permanganate in pulverized form. When ready to use this is stirred into 0.25 liter of freshly boiled tap water. No syringe is used, merely a catheter No. 9, French, with two openings at the tip and flaring outer end. The fluid still as hot as it can be borne by the urethral mucosa is drawn up into a rubber bulb and then forced out into the funnel opening of the catheter. It thus rinses out the urethra from the rear, and large amounts of fluid can be used. If the tap water contains salts that precipitate the silver nitrate, he varies the amount in the vials to correspond. The procedure is repeated three or four times a day and the whole technic is so extremely simple and easy that the patients apply it systematically and seldom shirk. Merk describes the biologic and chemical factors involved in the action of silver nitrate and shows how none of the would-be substitutes shares its truly potent properties, and how the claims made for some of the proprietary substitutes exalt into alleged advantages what are really drawbacks.

Wiener klinische Wochenschrift, Vienna

July 23, XXVII, No. 30, pp. 1093-1132

- 104 Prophylaxis of Cholera in Greece by Preventive Inoculation. (Choleraschutzimpfung.) C. Savas.
105 Changes in Spinal Fluid after Injection of Neosalvarsan. P. Biach, W. Kerl and H. Kahler.

- 106 Diastolic Blood-Pressure in Diagnosis of Disease of Aorta. J. S. Schwarzmann.
107 Electric Stimulation of Phrenic Nerve and Roentgenoscopic Findings Therewith. A. Henszelmann.
108 Deleterious Influence of Nephritis on Procreation. (Einfluss der Nephritis auf die Zeugung.) J. Cecikas

104. Anticholera Inoculations.—Savas states that there was no cholera in Greece or its dependencies until Grecian troops invaded Bulgaria last July and entered cholera-infested cities after fighting their way over 250 to 300 kilometers in twenty-six days. Refugees to the number of 150,000 also poured into Greece from various directions, and thus cholera broke out almost at once in many towns. Even Saloniki had 600 cases. As soon as the truce was proclaimed, systematic inoculation of the troops and populace was commenced and the epidemic was arrested. Fully 2,503 soldiers were treated for cholera in the hospitals, with a mortality of 515 (20.6 per cent.), including 27 officers and 9 surgeons, with recovery of 22. The number of cases in old and new Greece was 5,200 and 5,300, with 1,665 and 1,700 deaths. Savas prepared 1,000 liters of cholera vaccine and had twenty flying cholera laboratories at work, and in three months had vaccinated all the troops, a total of 150,000 men, and 350,000 of the populace, a total of 500,000 souls. When possible each person was inoculated twice with an eight-day interval. The vaccination was done by the regiment's surgeons, and never to but a small part of the regiment at one time. It never seemed to interfere with their military duties.

Savas gives tables which show graphically the success of the measure. For instance, in the whole army 19 per thousand developed cholera: 93 per thousand among the unvaccinated; 42 per thousand among those inoculated only once, and 7 per thousand among those who had been twice inoculated. The mortality among the unvaccinated was 27.5 per cent. while it was 12.2 among those inoculated once and 10.2 per cent. among the twice inoculated. Cholera soon disappeared from the infested towns after the dual vaccinations.

105. Changes in Spinal Fluid after Injection of Neosalvarsan.—Biach and his coworkers state that in nine of twelve cases sugar appeared in the spinal fluid after injection of salvarsan or neosalvarsan. The findings are tabulated and compared with an equal number not given salvarsan treatment. The stage of the syphilis or the reaction otherwise to the injections did not seem to influence the sugar content. It seems evident that individual conditions are responsible for the appearance of the sugar. Persons with it are, possibly, more liable to react to salvarsan with nervous symptoms.

108. Nephritis and Child-Bearing.—Cecikas thinks it is more than a casual coincidence that only eight of his twenty-eight married patients with nephritis have borne healthy children; abortion was common and five of the women never conceived.

Zeitschrift für Kinderheilkunde, Berlin

June, XI, No. 3, pp. 191-266. Last indexed July 25, p. 363

- 109 Peculiar Form of Diphtheria of the Gums in Two Infants. Z. v. Bokay.
110 The Urine During the First Few Days of Life. T. Franz and A. v. Reuss.
111 Metabolism with Congenital Fragility of the Bones. (Osteogenesis imperfecta.) A. Schabad.

Riforma Medica, Naples

July 18, XXX, No. 29, pp. 785-812

- 112 Woody Phlegmon and Inflammation of the Thyroid. (Flemmone ligneo del Reclus e tiroidite lignea del Riedel.) U. Cavalli.
113 Operative Cure of Gastric Cancer. G. De Francisco.

112. Woody Phlegmon.—Cavalli reviews the present status of our knowledge in regard to woody phlegmon and woody thyroiditis. Everything tends to show that they are identical processes and that nothing more is required for either than simple incision and draining at most. In a case reported, the large woody phlegmon developed in the abdomen after an operation for hernia which had been followed by an abscess and expulsion of the silk sutures. The patient was kept in bed, ichthyol packs applied with moist heat, and potassium iodid was taken internally. The hard swollen

4. *Massage*.—This may be a helpful measure when the manipulation of the abdomen is done by some one with general anatomic knowledge and special information about the abdominal organs of the patient under treatment. It should not be instituted if there is any suspicion of a duodenal ulcer, a chronic appendicitis or other inflammatory condition. The bladder should always be empty. The massage may be either superficial or deep. It may be performed by kneading, by a rotary motion in which the abdominal wall slips over its contents, by a rapid vibratory motion, or by rapid slapping with the edge or flat side of the hands, always with a general movement in the direction of the colon. It may be given with a mechanical vibrator. Self-massage may be carried on by rolling a cannon ball, or ball of clay covered with chamois skin or leather, or a wooden ball filled with shot, over the abdomen in the direction of the colon.

5. *Support of the Abdominopelvic Walls*.—In defecation, normally the anterior abdominal muscles, the diaphragm and the pelvic floor contract or are set so as to raise intra-abdominal pressure. In most cases with ptosis of the viscera, however, not only do the weak abdominal muscles fail to make pressure, but also, by allowing the viscera to fall away from the diaphragm, they deprive this latter of its usual resistance. It is therefore difficult to raise intra-abdominal pressure. Hence an inelastic support extending around the body and from navel to symphysis should be applied the first thing in the morning and worn till bedtime. In addition, if there is laxity of the pelvic floor, this should be attended to by a pessary or the necessary surgery.

6. *Foods*.—So far as their effect on the bowel movements is concerned, foods might be classed according to the chemical substances they contain, and the amount and character of their residue. They tend to promote peristalsis: (1) by increasing the bulk of the intestinal contents, as by their structural parts such as cellulose, skins, etc., and by unabsorbed oils and fats; (2) by mechanical irritation, as by seeds or husks; (3) by chemical action, as by sugars and fruit acids and their salts, and digestive products, such as soaps, amino-acids, etc.

It goes without saying that those who habitually undereat will be constipated; in fact, simple undereating is a frequent cause of constipation. The same is true of those who habitually eat food that is too readily digested. In either case the residue is insufficient. Therefore, abundant mixed meals usually favor bowel movements. For residue, cellulose, as furnished by fruits, vegetables, and other plant products is of very great importance; in fact, Rubener states that in the absence of cellulose almost everything is absorbed. Substances rich in cellulose pass into the intestines as paste and stimulate peristalsis, while meat, eggs and milk pass along as liquids, and so favor segmentation, but not peristalsis (Cohnheim). The products of the latter type are then rapidly absorbed and leave but little residue. Hertz reports that of the dry substance of meat, eggs, white bread and rice, only 5 per cent. appeared in the feces; while of the dry substance of green vegetables and brown bread 15 per cent., and of the dry substance of carrots and turnips, 20 per cent. was recovered. The feces of a mixed diet gave 100 gm. of water and 35 gm. of dry substance; the feces of a vegetable diet, 260 gm. of water and 75 gm. of dry substance.

Vegetables and salads mostly contain much fibrous tissue and cellulose. Many of them should be quite as much esteemed for the residue they leave for the bowels as for the nutritive matter they furnish for absorption. Such are lettuce, spinach, carrots, parsnips, oyster-plant, turnips, cabbage, cauliflower and squash. The salad dressing may be a means of furnishing abundant oil, which tends to be laxative.

Farinaceous foods include the cereals, the starchy vegetables, such as potatoes, and foods made with flour, such as bread. The cereals contain more or less cellulose. Oatmeal is especially laxative, because of the presence of indigestible husks and excessive cellulose and fat. It is often taken in the form of crackers. White bread leaves very little residue, but bread, biscuits and crackers made of graham flour, or containing bran, leave a large residue and tend to be laxative. It is to be remembered that graham flour is made by grinding the whole of the wheat kernel, bran and all, and is not bolted, so that it contains coarse particles. The so-called whole-wheat or entire-wheat flours have a portion of the bran removed and are bolted, but are coarser than white flour.¹

Fats tend to be laxative largely because of the soaps which are formed from them in the intestines. They may be given in the form of cream, butter, olive oil, etc. It goes without saying that the greater their nutritive power the less is their laxative effect; for if they are absorbed they do not pass on to the colon.

Fruits contain sugar, cathartic acids or salts, indigestible structural parts (fiber, cellulose, skins, etc.), seeds and non-absorbable colloid pectin bodies. Those most frequently considered laxative are prunes, figs and dates; but an apple, an orange or some grapes at bedtime or before breakfast will often insure the morning stool. Of this latter group, the acids and salts belong to the saline cathartic class. In young children one or two teaspoonfuls of orange-juice may be an effective stimulant to the bowel, its acid changing in the duodenum to the laxative sodium citrate.

Fruits and other coarse foods have the great disadvantage that they tend to promote gastric hyperacidity and flatulence. In obstructive or spastic types of constipation they may impede the action of the bowels, or may even form a food ball in the intestines. In one case, Coerr² removed from the ileum a ball which weighed 945 gm. and was composed of cereal husks, fruit seeds and other plant parts. In a number of instances we have found that the bowels acted better when the patient stopped fruit-eating.

7. *Water-Drinking*.—In those who live on a dry diet constipation is the rule; but the converse is not true, for the ingestion of large quantities of water does not make the bowels move. In two normal cases and six cases with chronic nephritis, we observed the effects of the administration of 8 ounces of water each hour for fifteen hours daily for one week. That was 7½ pints of water a day by mouth. In the normal cases the only noticeable effect was increased urination, the bowels not showing any increased activity. In the kidney cases the only observed effect was edema, neither the kidneys nor the bowels being appreciably increased in activity. As a matter of fact any excess of water is normally absorbed from the intestines with rapidity, and in any but kidney cases it serves to activate the kidneys rather than the bowels. Such absorp-

1. Bull. 143, U. S. Dept. Agric.

2. Coerr, F. D. H.: Enteroliths, THE JOURNAL A. M. A., Dec. 20, 1913, p. 2238.

tion of water may, however, be greatly retarded by the solution in the water of salts containing poorly absorbable ions, such as the saline cathartics, or by substances in the digestive canal that hold the water, such as agar-agar (See next paragraph). And since, in order to keep the feces of a soft consistency, the food residue must hold a certain amount of water, the drinking of a reasonable amount of fluid should be prescribed for those who habitually underdrink.

8. *Medicinal Agents Which Give Bulk and Soft Consistency to the Feces.*—The more commonly employed ones are: agar-agar, liquid paraffin, and small (not expulsive) doses of the saline cathartics.

1. Agar-agar absorbs water and increases greatly in bulk, so that it softens and enlarges the fecal mass. It is not absorbed unless changed bacterially, but it has the disadvantage that if it is not carried out, it forms a most excellent culture medium for the growth of intestinal bacteria. It is not a very effective laxative and usually requires the addition of a little phenolphthalein or cascara. Used in a similar manner are flaxseed and psyllium seeds, which absorb water, become mucilaginous, and increase the fecal bulk. They serve the purpose of making the bowels move, but they are very subject to fermentation, with the development of gas in the intestines.

2. Liquid paraffin (*petrolatum liquidum*) is a remedy that has been extensively employed since it was called to the notice of the profession by Sir Arbuthnot Lane. It is a viscous liquid that is not at all changed chemically and not at all absorbed from the alimentary tract, as shown by Bradley, 1911, and by Bloor, 1913, hence it serves to soften and to increase the bulk of the feces. It is also believed to be strictly non-irritant. Whether or not it exerts in the bowel a disinfectant effect on some of the strains of fecal bacteria has not been demonstrated. Finch and others have shown that it lacks disinfectant effect, but that, by virtue of its viscous and oily nature, it acts as an agent which retards the growth of bacteria implanted in it, but this does not serve as a test of its antibacterial value when mixed with food residue in the ileum or colon.

The refined oil is almost tasteless, is readily swallowed without any added flavor, and in doses of from 1 to 3 ounces a day is a mild but often efficient laxative. On account of its oily nature, it should not be taken just after meals, but preferably when the stomach is empty, that is, about an hour before lunch and dinner and at bedtime, for the oil will retard gastric digestion and prolong the emptying time of the stomach. In some cases, especially those in which the stomach-emptying is already retarded, the oil is not well tolerated, causes nausea or regurgitation, and has to be stopped. In others of the chronically constipated, the oil leaks from the anus so that it greases the clothes, yet without giving a proper stool; or it passes down as free oil without admixture with the food residue. In these cases reduction of the dose of oil and persistence in its use may meet with the desired result, but a small dose of another laxative, such as cascara, may be necessary.

On account of its recent extensive use as an internal remedy, a few words in regard to the quality and properties of this oil may be in order. It is quite generally asserted that the Russian oil is superior to the American for two reasons: (1) the absence of the harder paraffins, and (2) the absence of members of the olefin series of unsaturated hydrocarbons. But in the best

American oils the paraffins are removed by chilling, and according to Sir Boverton Redwood, in his extensive work on petroleum, there is no sufficient evidence that the unsaturated hydrocarbons of Pennsylvania petroleum are olefins, and that, in any case, if there are any present they are readily removable by strong sulphuric acid. Redwood further states that "comparison of results obtained with American, Galician and Russian petroleum shows that the same classes of hydrocarbons—the paraffins, the polymethylenes or naphthenes, and the aromatic hydrocarbons—are present in the petroleum from all three sources, but that the relative amount of naphthenes and in all probability of aromatic hydrocarbons is greatest in Russian and least in American petroleum." Marcusson³ claims that, of stable saturated hydrocarbons which react with fuming nitric acid, the Russian oils contain a higher percentage than the American oils. There is obviously some difference between the Russian and American oils, but in the well-refined products the difference is not marked.

As a matter of fact, after a certain fraction of petroleum of the specific gravity desired has been obtained by repeated fractional distillations, the regular process of refining is to subject it to the action of strong sulphuric acid, then caustic alkali, and then water for thorough washing. A stream of dry air carries off the water. In some instances the oil is filtered through diatomaceous earth or bone-black. This refining process must be repeated many times, indeed as often as fifteen or sixteen times, perhaps, and it correspondingly increases the expense of production.

The proposed text for the Ninth Revision of the U. S. Pharmacopeia describes "liquid paraffin" as free from fluorescence, without odor or taste, and not acted on or colored by concentrated sulphuric acid or nitric acid in the cold. The British Pharmacopeia specifies that when the oil is mixed with an equal volume of sulphuric acid in a test-tube and placed in boiling water for ten minutes with frequent agitation, the color of the separated layer of acid should not be of a deeper tint than pale brown.

I have tested a number of oils on the market. Of nine samples which have been mixed with an equal volume of sulphuric acid, a portion not having been heated, and a portion having been heated on a water-bath for ten minutes, nearly all fail to come up to the requirements. Three of these samples are American and are fluorescent. The others are sold as Russian oil. Obviously the oils on the market are of very poor quality.

We do not yet know whether, when used internally, an oil is or is not harmful if it is not fully refined; but till we do know, it is the part of wisdom to demand only the very best.

In regard to the specific gravity of these oils, it would seem that the more viscous oils, those of specific gravity from 0.880 to 0.890, are the ones of choice. I have been of the belief that lighter oils than this were likely to pass through the bowel without satisfactory admixture with the feces; but in a study of this subject, I find that there is no rule about it, and that at times in certain patients, the heavier oils as well as the lighter will give a stool of pure oil or will leak from the anus. The question of the requirement of a high specific gravity must, therefore, remain an open one.

3. Marcusson: Chem. Ztschr., 1912.

The more solid paraffin preparations, such as white petrolatum have also been employed in the form of a flavored and usually colored jelly. They are apparently just as active as the liquid preparations.

3. Of the saline cathartics, the softening doses are smaller than the usual expulsive doses; for instance, 1 or 2 drams of magnesium sulphate or milk of magnesia are given at bedtime, or morning and night. They act by retarding the absorption of water and so increasing the amount of water that reaches the colon. This prevents too great concentration of the feces in the colon. The larger expulsive doses of saline cathartics should not be used daily for any length of time, for they bring about a "peristaltic rush" for one or two hours only, and accustom the bowel to an entirely abnormal action.

Of the anthracene cathartics, senna, rhubarb, cascara, aloes, aloin and phenolphthalein, little need be said, for they have been prescribed with great benefit by the profession for many years.

At times the use for a few nights of an injection of one pint of warm olive oil to be retained through the night, together with one of the softening agents by mouth, will have a wonderful effect in starting the bowels on a new line of activity. Indeed, a number of the chronically constipated referred to us for advice as to the need of surgery, have apparently completely overcome their chronic stasis by this treatment. Sometimes it is wise to renew the oil injections for about one week in each month.

Having thus reviewed some of the simpler remedies, we might sum up the treatment of chronic intestinal stasis as follows: Regularity of defecation, measures to improve intra-abdominal pressure, measures to increase peristaltic activity, and measures to increase the bulk and softness of the colon contents. In the average case attention to habits of life and to the amount and kind of food, and the administration of a softening agent or a very mild laxative will be effective in overcoming the stasis, and, therefore, the toxemia. In severe cases, the addition of an oil enema at night may work a marvelous change for the better. In these chronic cases the drastic cathartics should be omitted from use.

If measures such as those spoken of, when carried out thoroughly, do not overcome the stasis and the toxemia, the question of surgery should be seriously considered.

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ABSTRACT OF DISCUSSION

DR. T. F. RILEY, New York: This question of intestinal stasis every practitioner must face. One or two points with regard to constipation may be mentioned. Many people who drink beer at night have free movements in the morning; light beers produce this, also buttermilk. Whether it is due to the liquid or to acid fermentation is a question. Chronic constipation is sometimes due to tightened sphincter. One should always examine the rectal sphincter. Its dilatation in children and infants will often cause the child to have a regular daily movement. In adults the use of dilators is often successful in producing these results. Bran is now popular, but, in its ordinary form, it becomes wormy and filled with vermin during the summer. A number of firms are putting out sterilized bran. I believe the large quantity of sulphur contained in the American mineral oil is distasteful to the patient. Whether a patient is benefited by the use of the oil or by the cathartics of the cascara series is a question. It is more disagreeable to take the oil than the tablets and the

results do not warrant the use of the oil in preference to the tablets in many cases.

DR. GEORGE PARKER, Peoria, Ill.: Does or does not phenolphthalein produce albuminuria?

DR. ROBERT A. HATCHER, New York: How about aloin used alone? We know that belladonna or atropin in small doses stimulates the vagus in the splanchnic area and there is a secretion in the pancreas which is due to this stimulation, and if atropin has this activity then it should have just as great an action on the liver. I would say that a good specimen of aloin is just as good as aloin, belladonna and strychnin. The specimen, however, must be good.

DR. W. A. BASTEDO, New York: I never heard of any special effect of beer on the bowels. I did not include consideration of the tight sphincter, as when there is such an obvious reason for constipation as that we should find it out. In normal people there are no feces in the rectum, or only a few remnants. When there are feces in the rectum and the patient is not cognizant of the fact, then we have a troublesome condition with which to deal. There is usually atony of the walls as well as lack of sensitiveness. Replying to Dr. Hatcher, in a number of instances I have tried aloin pills and aloin, belladonna and strychnin pills on the same patient, and the simple aloin pills did not work so well. It is true there is sulphur in the American oil, but this is not the cause of the excessive darkening with sulphuric acid in these samples. Undoubtedly the American oils are less well refined than they might be, for the samples shown are the best oils available on the American market. Two of them also are fluorescent and according to the pharmacopeia should not be used. Rowntree found that when phenolphthalein was given by the mouth it was not found in the urine, but when given hypodermatically it was excreted by the kidneys. I have noted that, at times, in patients taking only laxative amounts of phenolphthalein by mouth, the urine will at times turn pink on the addition of alkali. This would indicate some absorption with excretion by the kidneys. It does not cause albuminuria.

INTERNATIONAL STANDARD FOR TESTING VISION AND STANDARDIZING OTHER VISUAL TESTS*

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The cards of test-letters in common use are admirably adapted to the subjective determination of errors of refraction; but as a test for visual acuity they probably afford the poorest and most inexact standard on which any scientific observations are now based. As a standard for visual acuity, test-letters belong to the stage of mental and scientific development when the standard for length was "three full grains of barley corn taken from the middle of the ear," or "the distance a man can walk between sunrise and sunset."

As a help in the subjective measuring of refraction they are superior to any substitute that has been proposed and are not likely to be given up. But as a scientific standard they possess two essential defects:

1. The different letters when made as uniform as possible are visible from very different distances. This makes them unsuitable for a scientific standard.

2. They can be readily committed to memory by all who are sufficiently familiar with them to make them a convenient test. This lessens their value as a practical test.

* Read before the Section on Ophthalmology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

For these reasons test-letters should be standardized before they are used as a basis for records of visual acuity, and they should not be used when testing visual acuity is the only purpose to be served.

Every one who has attempted to establish a scale of test-letters has been struck by their differences in visibility. When Snellen attempted to make letters uniform by using a block-letter in which the lines and minimum spaces should have a uniform width, subtending a 1-minute angle at the standard distance, each letter to occupy a 5-minute square, he rejected as unsuited to the purpose the letters I, J, M, Q, W and X. Green carried the process farther, rejecting twelve letters and using fourteen. Oliver used only seven, but he still admitted letters that varied as much as 40 per cent. in visibility. The logical conclusion was reached only when a single set figure was adopted as the test, as in Snellen's optotypes for the illiterate published in 1873 (Fig. 1 A).



Fig. 1.—A, Snellen's optotypes. B, Jackson's incomplete square subtending an angle. C, Landolt's broken ring.

Before this section at the Nashville meeting in May, 1890, I proposed the simple form of the incomplete square, subtending an angle of 3 minutes (Fig. 1 B); in 1889 Landolt had suggested the broken ring (Fig. 1 C), and at Naples in 1909 the International Ophthalmological Congress adopted the broken ring as an international standard test for visual acuity, the most important official action that has ever been taken by an international ophthalmological gathering. Either one of these tests furnishes an exact measure for visual acuity, so far as visual acuity is capable of exact measurement, and one enormously superior to any furnished by letters, numerals or any series of conventional figures.

The difficulty of using a series of differing figures for a scientific test has been encountered by every one who has attempted to arrange a series of test-type, but few have appreciated the impossibility of an accurate standard of visual acuity resting on such a basis. In



Fig. 2.—One of Dennett's lines of test letters. All about equally visible at 20 feet.

1885 Dennett¹ read before the American Ophthalmological Society a paper on test-type in which this unsuitability of letters to furnish a standard test was well brought out. More recently it has been illustrated by the work of Gebb and Löhlein.² Dennett took the block-letters of the forms used in Monoyer's test-card, and found that letters 25 mm. in height could be recognized at distances that varied from 10.3 meters for the B and S, to 17.7 meters for U. He analyzed the differences of visibility and proposed and arranged test-cards in which the letters of each line should all be visible at nearly the same distance. To show how different such a test is from those we are accustomed to rely on, a line from one of these cards is reproduced in Figure 2.

So far as I know Dennett's tests have never been extensively used. While they would be superior to any other published series of test-letters for the scientific testing of visual acuity, they are not quite equal to the international standard for this purpose, and are distinctly inferior for the other purpose for which test letters are employed, the subjective determination of errors of refraction.

It would be absurd to spend time arguing the unfitness of letters as ordinarily printed on our test-cards for making scientific measurements, if they were not almost universally employed for that purpose. To use a tape measure that would spontaneously contract to 20 inches or stretch to 36 inches would be an absurdity of the same order as to use as equivalents letters, some of which can be just recognized at 20 feet and others at 36 feet, calling them all 20-foot letters.



Fig. 3.—Different forms of the same letter inscribed in squares of the same size, subtending an angle of five minutes at about 30 feet.

Such is the variability of letters of a single style used on a single card. The recognized forms of letters, even of capital block-letters, to be found in a well-equipped printing establishment, run into the hundreds. Three or four fairly distinct types of block-letters are in use on our test-cards. The differences of visibility vary with all these different forms. One firm has put out test-cards on the five-minute basis and others on a four-minute basis. The letters on the latter, although only four-fifths the height, can be seen quite as far as those on the former, because they are of simpler form. The block-letter U, if made as at A in Figure 3, can be recognized 50 per cent. farther than if made as at B in Figure 3. When to these differences in the letters of the roman alphabet are added the myriad differences of the different alphabets of the world, the *reductio ad absurdum* of testing visual acuity by letters becomes complete.

In contrast with this take the mathematical exactness and constancy of the international standard test. If one always used the same test-card and could have the same letter or letters of equivalent visibility on every line of the card, it would be possible to obtain records of practical accuracy for individual use. As this is not done, when of different visibility, the test-letters fail us even in this practical service. I have a test-card in which the letters are so chosen that the 6-meter line is quite as easy to read, perhaps is more often read correctly at the same distance, than the 7.5-meter line on the same card.

Our test-cards become brown with age, or worn out, and often are not exactly replaceable. I doubt if I could get now, without having them especially made, samples of any of the test-cards used in my first five

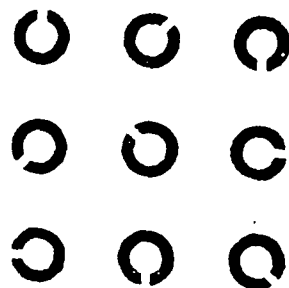


Fig. 4.—International test. With normal vision, the direction of the break in the ring can be recognized at 5 meters.

1. Dennett: Tr. Am. Ophth. Soc., 1885, iv, 133.

2. Gebb and Löhlein: Arch. f. Augenh., 1910, lxiii, 69.

years of practice. There are advantages in using different test-cards in testing the two eyes, or in testing the same patient on successive days, and as the different cards have different series of letters to be recognized at the same distance, the practical result is that all records of visual acuity made with test-letters have a very indefinite significance, even in the practice of one surgeon. When it comes to comparing the work of different men, especially in different parts of the world, the practical value of records of such visual acuity is greatly impaired. If the 6-meter line is easier to read than the 7.5-meter line, what do we learn when told that at one visit the patient read most of the 7.5-meter line, and then under treatment he read a week later all of the 6-meter line?

So much for the first objection to test-letters. The second objection is of equal practical importance. It has not been very rare for men required to pass visual tests for a government or railroad service to obtain a copy of the test-card used and commit the letters to memory and thus pass the usual examination without possessing the required visual acuity. Many ingenious contrivances have been devised to prevent such evasions of the test. William Thomson arranged radiating lines of test-letters on a circular card, only one of which lines could be exposed at any one time. Yet a person obtaining a card and memorizing the lines could repeat the smallest letter from his recognition of the largest. Grow³ devised a test-card which he called unlearnable, having sixty letters all of the standard 20-foot size, of which only a single line was exposed in such a way that the observer himself could not know which line was in use except by reading it.

Burch⁴ wrote, "It is astonishing how soon the exact description of a test-card becomes known if many people from the same neighborhood are tested." For the confusion color-test of vermilion letters on a green ground, he advises that the examiner keep paints of the right colors, and paint in new letters for any individual case. The late Dr. George C. Harlan used to tell of a schoolboy who, tested one day with an ordinary test-card of Snellen letters, was able next day to repeat the whole card correctly from memory. The caution sent out with cards for testing schoolchildren, to keep the test where the children will not have a chance to see it, is quite necessary. Probably all of us know without looking at the card the succession of letters on any test-card that we have used much, and the element of memory renders a patient's answers unreliable after a letter has once been recognized, so far as that letter is concerned.

So long as the vision has improved by a change of glasses and progressively smaller or more difficult letters can be read, the ordinary letter or numeral test-card serves its purpose most admirably; but when it is used simply to ascertain the maximum visual acuity, the chance of remembering the letter, instead of seeing it, is a serious drawback. This chance is not confined to letters or numerals. It applies to all cards of test-figures that cannot have their directions or relations changed at will.

Here lies the great advantage of the incomplete square or the broken ring. As was pointed out twenty-five years ago by Landolt, and a few months later independently by myself, if the card on which one or more of these tests are symmetrically placed is simply turned, it becomes impossible for the person tested to

know, except by sight, in what direction the incomplete side is placed. By using a single broken ring or a symmetrical group of them printed on the center of a symmetrical card, the same card can be used for any number of repetitions of the test, without giving any hint of the correct answer, except by vision sufficient to recognize the figure.

This manner of using such a test makes it impossible to have a single card with a whole series of broken rings of different sizes printed on it. But one size can be placed on each card. The same amount of cardboard cut into the proper pieces can be made to furnish an equally complete series. When a large number of persons are to be tested, the best plan is to use a single test of a certain standard size. This is to be looked at first from or beyond the standard of distance. Then the person to be tested should gradually approach the card, until the direction of the break is recognized.

For instance, in testing a class of schoolchildren, the test should be shown to the whole class and its use explained. Then the children should be sent beyond the standard distance and each one made to approach until the break in the ring is recognized. If we take the standard distance of 5 meters, recommended by the International Ophthalmological Congress, and mark it off on the floor in 0.5-meter spaces, or double this distance and mark it in whole meters we can, at a glance, ascertain the visual acuity in tenths. It is true that theoretically the variable distance introduces a minute inaccuracy through varying divergence of the rays from the test object; but this theoretical inaccuracy has no practical importance, and is so extremely minute in comparison with the inaccuracies that we have every day tolerated in connection with the use of test-letters that it may well be disregarded. What is meant by a symmetrical group of broken rings is illustrated in Figure 4.

The rings may be arranged in squares as 1, 4, 9, 16; or any number may be arranged in circular form. I believe that as its advantages are appreciated, the international standard test will come into universal use for the simple testing of visual acuity.

The international test, however, does not so directly help us in the problems of the consulting-room in practically determining and recording the visual acuity obtained by use of test lenses, a very important part of our daily work. In this work series of test-letters arranged in graduated sizes will hold their own against any other method of testing visual acuity that has yet been suggested.

With our ordinary cards of test-letters the practical accuracy of the international standard can be easily attained by the very simple expedient of numbering each line of letters by its equivalent value as compared with the international standard. For instance, instead of calling the 5-meter line a 5-meter line or a 16½-foot line, if it contains some of the more difficult letters, like B or S, number it 1, as expressing full vision according to the international standard. At the same time if half the letters on it can be read by an eye having vision of only 9/10 by the international standard, also indicate this on the card; half the letters equal 9/10, all the letters equal 1. If one or two letters can be recognized by a person having 8/10 vision, that fact might also be indicated; but practically it will usually be best to give only the two values; one value for a certain portion of the letters, as 1/2, and the other the acuity indi-

3. Grow: *Ophthalmology*, 1911, vii, 195.
4. Burch: *Ophthalmoscope*, 1912, x, 320.

cated by reading every letter on the line. In a word, we must standardize our cards of test-letters. When this has been done it is just as easy to read the standard of visual acuity indicated from the card used as to read the old meters or feet printed with each line to indicate the distance at which it was supposed letters of that size should be visible.

With the test-card standardized, we can use any arrangement of letters we choose, and as many different arrangements as we choose. We can employ one card one day and another the next day or the next month, or after twenty years, and still know that the comparisons of visual acuity are accurate. Each nation may test vision by cards suited to its own convenience. Illiterate test-cards of any sort may be employed, and if properly standardized the results will be perfectly comparable.

This matter, simple as it is, is one of great practical and scientific importance. It is entirely worthy of the careful attention of every association of scientific ophthalmologists. To standardize the cards already in use, and to bring the matter properly to the attention of those who publish such cards, it is suggested that this Section appoint a committee, and that every member of this Section should cooperate with that committee to secure the best possible standardization of all test-cards in common use.

Majestic Building.

ABSTRACT OF DISCUSSION

DR. NELSON M. BLACK, Milwaukee, Wis.: As stated by Dr. Jackson the test-letters, even when conforming exactly to the five-minute angle of Snellen, afford the poorest and most inexact standard on which any scientific observations are now based. The statement, "As a help in a subjective measuring of refraction they are superior to any substitute that has been proposed," is also true, but is it not the result of the majority of us having been willing to accept the results of Snellen's observations, and our own fatal tendency to let so-called well-enough alone? Some of the reasons why different letters are visible from different distances may be of interest, and are well covered in the conclusions of Miss Roethlein's most interesting paper, "The Relative Legibility of Different Faces of Printing Types" (Publications of the Clark University Library, Jan. 12, 1912.)

There are other reasons in addition to those given by Dr. Jackson why test-letters should be standardized before they are used as a basis for records of visual acuity. The fact that certain letters of say the 6/VI line are more easily recognized than others at 6 m. frequently gives rise to comments from the patient, such as, "Why am I unable to see all the letters on the line with equal clearness?" and in the absence of the knowledge that the visibility of different letters varies with the distance, gives rise to an idea that perhaps they are not receiving the best correction of their refractive errors. This phase of the subject deserves at least some consideration as well as the factor of the non-uniformity of the results obtained at examinations made at different times and those made by different individuals.

That the letters on the standard test-cards can be easily committed to memory by all who are sufficiently familiar with them lessens their value as a practical test, is a defect which would still exist in the event test-letters were standardized to equal visibility at the same distance. This, however, may easily be overcome by having several cards with the letters arranged in different order and with but one line of letters on each card.

In the use of the international tests some questions arise which may or may not be of importance; for instance, the examinee is informed that the test consists always of the same thing, that is, to designate in which direction the break in the ring exists and that the position of the break in each

ring differs from all the others. Will such knowledge cut down or increase the possible ratio of correct guesses? We all know how frequently, in refraction, patients will call the letter O, G or C or Q or the letter C, O or G or Q. The frequency of this mistake varies with individuals, also with the kind and degree of refractive error. Another question which suggests itself is, Will the fact that the break in the letters C and G is, and always has been, toward the right be a factor in increasing the visibility of the international test-rings in which the break in the circle is toward the right, either above or below the horizontal, as a result of constant association? A third question which should be determined is, What effect on the visibility of the break in the rings will various degrees of astigmatism at various axes have? The ability of the normal eye to distinguish the form of an object depends on: 1, the size of the image received on the retina; 2, the amount of light reflected from the object and its background; 3, the contact between the object and its background.

Dr. Jackson's paper deals largely with the first factor, but there are two remaining factors to be given serious consideration before we can arrive at uniformity in the test for visual acuity.

DR. EDWARD JACKSON, Denver: The idea of standardized letters is this: We must have the letters to do our refraction work. When the refraction work is done, when we have the best lens, we want to record the visual acuity. Now the thing is, from the card we have been using to be able to put down the visual acuity. The way in which this may be done is illustrated by the use of the cards I called attention to yesterday. Instead of giving 6 meters for the first line of letters—that is the distance at which they would be placed in the Snellen scale—this card is prepared for use at 5 meters. The reading of that whole 6-meter line represents 8/10 vision; the reading of the easier letters of the line represents 7/10 vision, as compared with the international standard. After such a card has been used you have the visual acuity according to the international standard, instead of rating V-6/6 or something of that kind. That is the reason for having the standard visual acuity printed on the test-card; it would enable us to standardize our records of visual acuity. With reference to another point of illumination and of background that Dr. Black referred to, the placing of the international broken ring at the end of each line of this card was done with that in view. In comparing the test letters with the international standard we have them on the same card and used by the same light, and if we have taken the proper precautions in standardizing the cards, we will have no difficulty in getting at the true visual acuity.

CONVERGENCE INSUFFICIENCY*

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Convergence insufficiency is a frequent anomaly. Probably 8 per cent. of our eye patients show some degree of it, and this proportion would certainly be increased if every patient that presented himself were carefully tested. This statement by no means implies that in all or even a majority of these cases the convergence insufficiency is responsible for the symptoms. On the contrary, in a great many instances convergence insufficiency—especially the accommodative form—seems to cause no trouble whatever. Still it does cause trouble often enough to make it important for us to consider carefully its causation, varieties and treatment.

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In considering a condition like this it is obviously essential that first of all we should have clear ideas of its nature. We may start, therefore, with a definition and say that convergence insufficiency is a condition the distinctive feature of which is that the eyes converge imperfectly or with difficulty, the disability not being due to impairment in power of the internal recti *per se*. It is, in other words, an anomaly of a coordinate movement of the eyes and not of the eye muscles, and as such it is in all ordinary cases a strictly binocular affection, each eye being equally involved.

DIAGNOSIS OF PURE CONVERGENCE INSUFFICIENCY

A pure case of convergence insufficiency presents the following features:

1. Deviation for distance little or none.
2. Prism divergence (abduction) not excessive.
3. Prism convergence (adduction) subnormal and difficult.
4. Exophoria for near points marked and increasing with approximation of test-object.
5. Convergence near-point abnormally remote.
6. Lateral movements of each eye inward and outward normal in extent and comitant.
7. Diplopia, if present, not increasing to right or left.

8. Convergence reaction of pupil deficient or absent.

These signs deserve a brief consideration.

1. *Deviation for Distance.*—In pure convergence insufficiency there is rarely more than a centrad of exophoria for distance. Not infrequently there is orthophoria, and occasionally even a centrad or so of esophoria. Even when the convergence insufficiency is beginning to be complicated by a divergence excess so that there is more or less exophoria for distance, this is moderate in amount and always much less than the exophoria in near vision.

The tests for distance should be made both with and without the patient's distance-glasses in order to determine the effect that the latter have on the deviation.

2. *Prism Divergence.*—The prism divergence (so-called abduction) for 5 or 6 meters ranges in general from 3 to 8 (in most cases from 4 to 6) centrads. It corresponds, therefore, to the normal. In some cases it may even be subnormal. When the prism divergence is 9 centrads or over, the condition is no longer a pure convergence insufficiency, but is complicated with a divergence excess. There is then usually a more or less considerable degree of exophoria for distance.

3. *Prism Convergence.*—The prism convergence (so-called adduction) for 5 or 6 meters is often low (varying from 6 to 12 or 14 centrads). Low prism convergence in itself means nothing abnormal, since many persons with normal convergence are unable at the start to overcome prisms, base out, of more than 10 or 12 centrads. In such persons, however, it is evident that this inability is due to lack of facility rather than lack of power, and when they once learn, which they do after two or three trials, they go steadily and easily upward, so as ultimately to overcome prisms of 30, 40 and 50 centrads. Moreover, when they can overcome a prism at all, they can hold the images together without difficulty. In convergence insufficiency, on the other hand, it often happens, particularly in the serious and troublesome cases, that the patient who can overcome, say, a 12-centrad prism, can only with difficulty and strain pass from this to

a 14-centrad; and even when he unites the images with the higher prism, he cannot hold them together for more than a moment. In extreme cases of this sort the inability to overcome prisms, base out, is very marked. I remember one instance in which the patient after weeks of faithful trial was unable to advance beyond a 6- or 7-centrad prism. So in cases of convergence paresis (see below) the prism convergence is extremely low or absolutely nil; and it also, of course, is abolished in complex cases in which a well-marked divergent squint has developed; but the latter are never pure cases of convergence insufficiency.

In most cases in which the prism convergence is low and difficult to acquire, it can still be brought to the normal by persistent training, and it is just in such cases, I believe, that training of this sort, when ultimately successful, is most beneficial.

4. *Exophoria for Near Vision.*—The exophoria for 25 cm. ranges from 6 to 30 centrads. Measurements made with the screen, parallax and phorometer usually agree and are pretty constant, provided the test-object is sharply defined (a fine dot is best for the purpose), and provided the patient is directed to fix and focus sharply on it. If these precautions are neglected, the amount of exophoria may vary widely even during the same examination. It often also varies from day to day, the amount depending on the patient's condition and the energy he is able to exert at the time. It will also be modified by the visual acuity and by the strength of the glasses used, and the effect of the latter should be particularly studied, in order to determine how far the deviation is accommodative in origin. In presbyopes a test should always be made with the reading-glass, and the strength of the latter should always be noted.

The exophoria regularly increases as the test-object is brought nearer the eyes. In convergence paresis this increase is particularly marked and uniform. In fact, in order to make the diagnosis of paresis, we have to make our near tests both beyond and within the usual 25-cm. distance, for instance, also at 1 meter, 50 cm. and 10 cm. (see below, in the discussion of convergence paresis).

However great the exophoria for near vision, in pure cases of convergence insufficiency it is habitually overcome at the ordinary reading-distance, provided both eyes can see the object of fixation. The patient, that is, has ordinarily at near points an exophoria and not a squint, although he may, and often does have momentary failure of binocular fixation with consequent double vision and confusion. It is only when the insufficiency is complicated with other factors (consecutive divergence excess, secondary weakening of the interni) that a constant squint for near points develops.¹

5. *Convergence Near-Point.*—The convergence near-point (Pc) is abnormally remote. The normal position of the convergence near-point, as determined by a number of measurements, is in adults from 5 to 9 cm.,² and in children 4.5 to 8 cm.³ from the base-line connecting the centers of the two eyes. It can be quite precisely measured as follows: The patient's glasses, or in lieu of these a trial-frame or spectacle-

1. Even when complicated with a marked divergence excess, so that the deviation is as high as 50 centrads, the patient may at times get binocular single vision. But in such cases the original condition is always probably a divergence excess, the convergence insufficiency being secondary and of recent development.

2. Indicating an actual convergence of from 38 to 62 degrees.

3. Indicating an actual convergence of from 45 to 65 degrees.

frame, is placed on the patient's nose and is used as a reference plane which is adjusted so as to be just 11.5 mm.⁴ in front of the corneal apex when the eyes are directed straight ahead. The apex of a millimeter rule is placed against the point at which the reference plane crosses the nose, and the rule itself is held perpendicular to the plane, so as to lie strictly in the midline. Along this rule the test-object, which consists of a pin with a white head 2 mm. in diameter, or a minute dot on a card, is carried straight toward the patient's nose, the patient all the time being exhorted to converge on it as sharply as he can. The moment the object doubles insuperably, or the moment one of the patient's eyes is seen to diverge, the distance of the object from the reference plane is measured. If to this distance 2.5 cm. be added, the result will be very nearly the true distance of the convergence near-point from the intercentral base-line. If the latter distance (PcB) is beyond 8 cm. it denotes some weakness of convergence, and if beyond 10 cm. a well-marked insufficiency. Or we may say that the patient has a convergence insufficiency if his *convergence index*⁵ falls below 30.

It is understood that in making this test the patient should try as hard as he can to converge on the test-object and to fuse the images as soon as the object tends to double.

In simple convergence insufficiency the convergence near-point is *absolute*, that is, the patient brings the eyes together so that both are directed at the test-object. When there is exotropia, only one eye is directed at the object and converges on it as it is approximated. In that case the other eye may make no attempt to converge at all, so that as fast as its fellow eye comes in, it goes out. Or, it also may make at least an attempt to converge and, although never actually directed at the test-object, may follow it in its movement toward the eye down to a certain point (*relative* convergence near-point) and then suddenly give up the effort and diverge.

The closer the relative near-point of convergence is, the greater we judge the patient's converging power to be, and the more we can rely on it in supplementing the effect of exercise or of operation.

When the patient has a considerable vertical deviation, his converging power may appear to be poor, when really it is quite good, for when the test-object is brought toward the eyes, he sees two images which he cannot bring together because they are on different levels. As he cannot unite them he makes no attempt to converge. In that case the dot used as a test-object should be replaced by a vertical line. The patient will converge on this, because when he does so the two images will unite, even if on different levels, since the bottom of one will join with the top of the other. On such an object a patient will be able to converge sharply, even when for the dot he apparently had very little converging power.

4. The distance is 10.5 mm. if the eye is quite myopic, 12.5 mm. if the eye is highly hyperopic.

5. The convergence index (Ci) = $100 \times \frac{1}{2}$ interpupillary distance

PcB

Ci ordinarily ranges from 35 to 50, although it sometimes equals 55 and may even (especially in children) run up to 60 or 63. When Ci is between 15 and 59, that is, for all values commonly encountered in both normal and abnormal cases, the relation holds that $C = Ci + 3^\circ$, where C is the corresponding convergence of the eyes in degrees. For higher values of Ci the following relations obtain:

Ci	C	Ci	C
60-63.....Ci + 2°	75-77.....Ci - 2°		
64-67.....Ci + 1°	78-80.....Ci - 3°		
68-71.....Ci	81-83.....Ci - 4°		
72-74.....Ci - 1°	84-85.....Ci - 5°		

6. *Lateral Movements of the Eyes.*—In a pure convergence insufficiency, the inward and outward rotations of each eye, when moving parallel with its fellow, are normal in extent and comitant. This is found both in monocular and in binocular testing. An eye, for example, which, in attempting to converge with its fellow, halts when its corneal margin is 2 or 3 mm. from the caruncle, will, when tested with the perimeter or tropometer, rotate 45 or 50 degrees inward, and then, following the other eye as the latter moves outward, will turn in fully to the caruncle. Moreover, the movements are comitant, one eye moving as fast as the other without wavering or lagging on the one hand, or overshooting, on the other.

7. *Diplopia.*—Diplopia if present does not increase as the eyes are turned to the right or left. Owing to the natural tendency of the eyes to diverge when raised and to converge when lowered, the crossed diplopia caused by a convergence insufficiency tends to increase in looking up and to diminish in looking down. In slight cases of convergence insufficiency it may be present only in the upper field. Owing to the fact that the diplopia is caused by the inability of the eyes to converge properly, it naturally increases as more and more call is made on the converging power, that is, as the test-object is brought nearer the eyes. In a convergence paresis, this increase is particularly striking and takes place with almost mathematical regularity from distance to near, beginning to be observable at 20 feet or more from the eyes.

8. *Pupillary Signs.*—In cases of marked convergence insufficiency with remote convergence near-point, and particularly in cases of convergence paresis, the convergence reaction of the pupil is diminished or absent. In ordinary cases if we bring an object toward the eyes and urge the patient to fix sharply on it, the pupils contract as the eyes converge. The moment he gives up the effort of convergence and the one eye flies out, the pupils dilate. The more remote the convergence near-point, the sooner this will occur and the less marked will be the initial contraction of the pupil. In great weakness or in actual paresis of convergence there may be no initial contraction of the pupils at all. In this case if the reaction to light is present we have the inverse of the Argyll Robertson pupil.

DIFFERENTIATION FROM OTHER FORMS OF EXOPHORIA

The two chief conditions from which a convergence insufficiency is to be differentiated are divergence excess and insufficiency of an adductor.

DIFFERENTIATION OF CONVERGENCE INSUFFICIENCY AND DIVERGENCE EXCESS

CONVERGENCE INSUFFICIENCY	DIVERGENCE EXCESS
Exophoria for distance slight (only one or two centads).	Exophoria for distance marked (from 5 to 30 or more centads).
Exophoria for near marked (8 to 30 centads).	Exophoria for near moderate (much less than for distance) may be almost nil.
Prism divergence not excessive (4 to 8 centads).	Prism divergence excessive (10 to 30 centads).
Prism convergence deficient and difficult to increase by exercise.	Prism convergence normal or readily brought to normal after two or three attempts.
Convergence near-point remote (over 9 cm. from intercentral base line).	Convergence near-point normal.
Crossed diplopia, if present, marked for near points and increasing as object is brought toward eyes.	Crossed diplopia if present, marked for distance. Usually none for near.

In both, rotations of eyes inward and outward in performing parallel movements normal and comitant; crossed diplopia, if present, not increasing to right or left, but increasing somewhat in looking up and decreasing somewhat in looking down.

Divergence Excess.—A considerable number of cases of exophoria, probably a third, in fact, of all the cases that we see, are due primarily to what I call divergence excess. This condition is differentiated from a convergence insufficiency by the accompanying signs given in parallel columns.

Insufficiency of an Adductor.—From insufficiency of an adductor (internal rectus, superior and inferior recti), convergence insufficiency is differentiated by the fact that in the former condition either the power of movement of the affected eye inward is obviously impaired, or at all events the exophoria and the crossed diplopia, if present, increase definitely as the eyes are carried to one side or the other.⁶

MIXED AND SPECIAL FORMS

In many cases a convergence insufficiency is combined with other conditions, and sometimes the picture is so complicated as to render the diagnosis difficult. The most common combinations are:

1. *Convergence Insufficiency with Divergence Excess.*—This combination is very frequent. In fact, in the regular development of an ordinary divergent squint, what generally takes place is that either a primary convergence insufficiency has superadded to it a secondary divergence excess, or vice versa. In the former case, we see first an exophoria for near with normal relations for distance, later a squint for near combined with an exophoria for distances, and finally a squint for both distance and near with total absence of converging power. When the divergence excess is the primary condition, we have first an exophoria for distance with normal relations for near. This condition may last indefinitely or at least for many years without change. Then there develops an exophoria for near also, and a squint for distance, and ultimately a squint at all ranges, with, however, often at least partial retention of converging power. The last-mentioned is shown by the presence of a relative near-point of convergence. Whichever condition is the primary one, the final picture presented by the combined conditions is then a squint marked for both distance and near, and great, though by no means always total, loss of converging power.

2. *Convergence Insufficiency with Secondary Weakness of Interni.*—Secondary weakness of the interni often develops in cases of divergent squint of long standing; that is, as a result of a continued insufficiency of convergence combined with a divergence excess. In this case the power of rotation inward in making parallel movements of the eyes to right and left is obviously diminished.

3. *Convergence Insufficiency with Insufficiency of the Elevators or Depressors.*—This condition, which is manifested by a vertical deviation, increasing characteristically in some special quarter of the field of fixation, is not infrequent. In some cases of the sort the convergence insufficiency is more apparent than real (see below in the consideration of etiology).

4. *Convergence Insufficiency with Divergence Insufficiency.*—This rare and troublesome condition is marked by an exophoria for distance with very low prism divergence or actual homonymous diplopia for distance, and by marked exophoria for near with remote near-point of convergence. In some extreme cases there is an actual paresis of both divergence and convergence (see below in the section on convergence paresis).

5. *Anomalous Cases.*—Cases of rather peculiar physiognomy are those in which (a) there is a marked exophoria for near (10 or 12 centrad) with normal relations for distance and with normal convergence near-point, and (b) those with very slight exophoria for near but with remote convergence near-point. The former are perhaps to be explained as due to a slight weakness of the interni *per se*, and the latter as an ordinary convergence insufficiency, in which the patient by special effort at times overcomes the deviation.

ETIOLOGY

Convergence insufficiency is either primary or secondary.

A. *Primary Convergence Insufficiency.*—This may be either accommodative or non-accommodative.

1. *Accommodative convergence insufficiency* is the form in which the patient converges insufficiently because he accommodates insufficiently. This form is observed, first, in uncorrected myopes who, as they do not have to accommodate in looking at near-points, so do not converge either; second, in corrected presbyopes and hyperopes who, when they put on convex glasses, find themselves enabled to read without exerting their usual quantum of accommodation and, as they let their accommodation relax, relax their convergence also.

In all these cases of accommodative convergence insufficiency it is evident that the patient really has full power of accommodation, but, owing to refractive conditions of one kind or another, he exerts only part of it. As he puts only a portion of his available force into his accommodative work, he also puts only a portion into the work of converging and hence converges imperfectly. But there is another class of cases, rather frequent, in which the accommodation is really subnormal, and the patient works it to its limit, putting into it all the nerve-power at his command. How he will converge in this case will depend on the cause of the weak accommodation. There are two possibilities. Either the patient's neuromuscular accommodative apparatus is defective and his nerve-power is normal, in which case he makes a tremendous effort and nevertheless accomplishes very little, or his accommodative apparatus is normal but the nerve-power supplied to it is inhibited in some way, in which case he makes but little effort and therefore accomplishes but little. In the former case there is overstimulation, in the latter case understimulation of the accommodative apparatus and hence also of the converging apparatus. If the converging apparatus is normal, the patient should in the first case have a convergence excess, and in the second case a convergence insufficiency as the result of a genuine accommodative weakness. Examples of these two kinds of association do, in fact, occur, but are not very common, so that accommodative convergence insufficiency is apparently not often due to accommodative weakness of central origin. It more frequently happens that the two conditions, instead of being dependent one on the other, occur simultaneously, both being due independently to the same cause. In this case, of course, the convergence insufficiency is non-accommodative in origin.

Akin to accommodative convergence insufficiency is what we may call the *visual* form in which, owing to indistinctness of vision in one or both eyes or to incorrigible vertical diplopia, the patient has little impulse to converge. This is found in uncorrected presbyopia and in hyperopia of high degree; in anisometropia

6. Increase from the midpoint to both sides if both interni are weak.

(very common); in poor vision due to opacities in media and also in absolute blindness of one eye, and in hyperphoria or other muscular anomalies which render fusion difficult. In cases of this sort the convergence insufficiency is usually spurious, at least at the outset. The patient, that is, can converge perfectly, but has no inducement to do so because the diplopia produced by the failure to converge is no more confusing than is the patient's vision when he converges well and superposes the two visual images. In other words—and this holds for most of the cases of the accommodative form too—the condition at the beginning is rather a convergence disuse than a convergence insufficiency. Later, however, continued disuse develops an actual insufficiency.

2. The *non-accommodative* form comprises about 60 per cent. of all cases of primary convergence insufficiency. It includes all those cases in which the refraction and accommodation cannot in any way be held accountable for the genesis of the motor anomaly. This is the case in patients who have low degrees of hypermetropia and astigmatism with equal refraction and with good vision in both eyes; also in patients who, though myopic, have been wearing their myopic correction for a long time, so that they are using their accommodation quite like emmetropes. In all these cases it is noted that continuous wearing of the proper refractive correction does not affect the muscular deviation except possibly to increase it. In a true accommodative convergence insufficiency, on the other hand, the deviation is diminished or even abolished altogether by the continuous use of the right glasses.

Non-accommodative convergence insufficiency is due to (a) conditions causing general nervous or systemic depression (neurasthenia, hysteria, anemia, convalescence from exhausting illness, and the like); (b) nasal obstruction (quite common), and (c) some unknown cause acting in persons whose muscular power and coordination otherwise seem normal. The more serious and inveterate cases, and particularly those that approximate to a convergence paresis in character, are perhaps due to a localized lesion, congenital or acquired, of the central nervous system (see below, section on convergence paresis).

As already noted, a convergence insufficiency, even when non-accommodative, may be associated with a weakness of accommodation which, like the insufficiency itself, is of central origin, the two being due independently to the same cause.

3. *Combined Accommodative and Non-Accommodative Forms.*—These mixed forms are not uncommon. Thus a convergence insufficiency, itself non-accommodative, may be increased and its symptoms may be intensified by the introduction of an accommodative element. This happens, for example, when we give a hyperope or a presbyope who already has a convergence insufficiency, too strong a glass for reading.

B. *Secondary Convergence Insufficiency.*—When a divergence excess has lasted a long time, a secondary convergence insufficiency often develops, producing the combined form of deviation, the characters of which have been noted. (See remarks on "Course," below.)

CONVERGENCE PARESIS

No absolute line of demarcation distinguishes a convergence insufficiency from a convergence paresis. In fact, the extreme form of convergence insufficiency that we see in a well-marked periodic divergent squint is really a convergence paresis more or less obscured

by complicating conditions. The term "convergence paresis," however, is usually applied to a condition often sudden in development and evidently due to localized lesion or functional disturbance of the nerve centers, marked by the following features:

1. In far distance (points beyond 20 or sometimes beyond 50 feet), little or no deviation.

2. The moment an attempt at convergence is made, that is, as soon as the patient tries to follow an object brought from the 20-foot distance toward the eyes, exophoria and crossed diplopia set in and increase *pari passu* as the object is approximated. The increase takes place with almost mathematical regularity.

3. The diplopia once evident is almost or quite insuperable. Thus, when even it is so small that it requires only a 2- or 3-centrad prism to correct it, the patient is usually quite unable to correct it by voluntary effort. So, too, at a distance at which he normally sees single, he is quite unable to overcome even a 2- or 3-centrad prism, base out.

4. No attempt is made at convergence. When an object is carried toward the eyes, one turns toward it and the other turns off, *pari passu*. In a pure convergence insufficiency, however great, there is usually at least an attempt at convergence.

5. Just as in ordinary convergence insufficiency, so also in convergence paresis the lateral movements of the eyes are unaffected, each eye as it moves with its fellow to right or left rotating quite normally inward. So also the crossed diplopia, taken at any given distance, does not increase as the eyes are carried to the right or left. In other words, we are not dealing here with any paresis of the interni *per se*.

6. The convergence reaction of the pupil is usually absent.

Convergence paresis is rather rare. Still rarer is its combination with a paresis of divergence. In this condition, there is a single vision only at one definite point. Beyond this there is homonymous diplopia, within this crossed diplopia. Looking at an object situated at the point itself, the patient cannot overcome a prism, however weak, either base out or base in. It seems, in fact, as if his eyes were fixed immovably on a single point. But when it comes to making lateral or up and down movements, each eye moves as freely as usual and always in harmony with the other.

Convergence paresis may also be associated with paralysis of up-and-down movements of the eyes. It is at times, too, accompanied by paresis of accommodation, the lesions in this case being strictly coordinate; that is, they occur simultaneously as the result of the same cause and are in no sense dependent the one on the other. The picture then presented is very striking.

Convergence paresis is doubtless due to some lesion of the central nervous system. It occurs in multiple sclerosis (in 3 per cent. of the cases according to Uhthoff) and occasionally in tabes, and in isolated cases it is the result of traumatism, hysteria, tumor, hemorrhage and developmental disorders arising from affections of the ductless glands. It is also found as a congenital anomaly in most cases of the peculiar syndrome marked by paralysis of the external rectus, restriction of power of the internal rectus and retraction movements of the eyes.

In a case of mine which was associated with a marked paresis of accommodation, the voluntary dissociation of the eyes produced by prolonged work with the microscope seemed to be the starting-point of the trouble. In some cases the etiology is quite obscure.

COURSE

An accommodative convergence insufficiency of the ordinary type is, as I have noted, at the outset simply a convergence disuse. That is, the converging power is normally strong but is not used to its full extent. After a time, owing to this continued disuse, the converging power becomes actually subnormal. When this process is once initiated, there is a tendency, although by no means an invariable tendency, toward increase.

If it increase to a considerable point and is long maintained, it is then regularly followed by a divergence excess. Similarly, a divergence excess which has lasted a long time is likely to be followed by a convergence insufficiency. Thus result the combined forms (see above "Mixed and Special Forms"), which constitute the ordinary form of a fully developed divergent squint. A divergent squint, in other words, usually develops in one of the two following ways:

1. An accommodative or at all events a visual convergence insufficiency develops out of a convergence disuse. This at first is a heterophoria, which is marked for near points only. Gradually this increases by the superadding of a divergence excess, and now there is a heterophoria for a distance with a divergent squint for near (direct periodic squint). The deviation at both distances increases until ultimately there is a squint both for distance and near (continuous squint), but more marked for near.

2. A divergence excess, which produces a heterophoria marked for distance and but slight for near, which may last unchanged for years, ultimately increases by the superadding of a convergence insufficiency. There is now a divergent squint for distance and a heterophoria for near (inverse periodic squint). These increase until ultimately there is a squint for both distance and near (continuous squint), more marked, however, for distance than for near.

In both cases, a further change that takes place after a while is a weakening of the interni (hitherto normal) and a contracture or hypertrophy of the externi. The inward rotations are then no longer normal and the deviation becomes greater still.

The course of a non-accommodative convergence insufficiency—and the same is true of a convergence paresis—depends on its causation. If due to a temporary condition, the insufficiency or the paresis will clear up; otherwise it may remain unchanged for years or in some cases gradually increase. A non-accommodative convergence insufficiency may thus also give rise to a divergent squint.

SYMPTOMS

The symptoms of convergence insufficiency are diplopia (with accompanying confusion and vertigo), asthenopia, eyecache, headache, and sometimes more remote reflex symptoms.

Diplopia, although it can almost always be elicited, is rarely a subject of spontaneous complaint except in convergence paresis, when it is often very distressing. Confusion (especially in reading) and vertigo may occur, but are not common except in extreme cases of insufficiency or cases of actual convergence paresis.

Asthenopia is a common symptom, and often is associated with burning and irritation of the eyes (asthenopia irritans) or with eyecache (asthenopia dolens). The asthenopia is sometimes extreme and incapacitating. It is often aggravated by the use of

convex glasses, because with them the patient not only tends to relax his accommodation and hence increases his convergence insufficiency, but also brings objects close and so puts more strain on his convergence. Sometimes, in fact, the asthenopia is so great that the patient cannot wear the proper glasses at all.

Headache is not a very common symptom, nor are reflex symptoms very often encountered—not so often, indeed, as in other muscular anomalies. Of course when squint has developed, the deformity due to it constitutes for the patient a symptom of considerable moment, and in convergence paresis and in convergence insufficiency due to general conditions we have to reckon with the symptoms arising from the causal lesion. So, too, we have to reckon with the asthenopic symptoms due to the associated insufficiency of accommodation when this is present. These may be difficult to distinguish from the symptoms of convergence insufficiency itself.

In a large proportion of cases of convergence insufficiency there are no symptoms whatever that can be referred to the motor anomaly itself, that is, that are not relieved simply by treatment of the attendant conditions (refractive errors, etc.).

TREATMENT

The measures available for treating a case of convergence insufficiency are:

1. Correction of the refraction.
2. Correction of exciting causes other than refractive errors.
3. Practice in converging on an approximating point and with prisms, base out.
4. Practice with the amblyoscope, stereoscope and bar-reading.
5. Practice in the recognition of diplopia with the aid of the red glass, etc.
6. Prisms for constant wear.
7. Operation.

1. In a case of convergence insufficiency the first demand of treatment is to correct the *refraction* with scrupulous care. By so doing we remove any accommodative or visual element which may aid to produce the insufficiency, and thus in a moderate proportion of cases relieve or at least diminish the tendency to deviation. In a much larger proportion of cases, the correction of the refraction, while not producing much effect on the deviation itself, does relieve the symptoms.

A convergence insufficiency associated with hyperopia is sometimes aggravated by the full correction of the refractive error. In such cases we may have to undercorrect the hyperopia by an amount which will vary with the conditions and symptoms present in the given case, but which in general will have to be determined experimentally.

In presbyopia associated with convergence insufficiency it is particularly important not to add too strong a glass for reading, since with such a glass the patient will have to bring objects too close and thus impose too great a strain on the already subnormal convergence. Neglect of this precaution is a frequent cause of trouble in giving glasses to presbyopes, especially in the early stages of presbyopia.

As in other muscular conditions, so also especially in convergence insufficiency, correction of the refraction should be the first means used, and until its efficacy has been tested by long and persistent trial, other

treatment should not generally be employed. Otherwise we shall fail to differentiate between the symptoms due to the refractive error and those due to the muscular trouble. By eliminating one set of symptoms at a time, and the one, moreover, that is usually of most significance to the patient, we shall be surer of our diagnosis and more likely to give ultimate relief. It need scarcely be added that the earlier in a case the refractive treatment can be applied the better the result we may expect.

2. In non-accommodative convergence insufficiency and particularly in convergence paresis, the exciting cause (neurasthenia, hysteria, nasal disease, organic disease of the nervous system) must be sought out and treated. In cases the etiology of which is not evident, tonics, open-air exercise and the restriction of near work for a season are often indicated.

3. Exercising the convergence by simply making the patient fix sharply with both eyes a dot brought steadily up toward the eyes or by practice with prisms, base out, is of service both in accommodative and in non-accommodative convergence insufficiency. I have 'elsewhere' laid down precise rules for what I believe to be the best method of making the practice. In general I think it important that in simple convergence insufficiency, exercise with converging prisms should be employed with the test-object at the reading distance only, while if there is an associated divergence excess the exercise should be done with the object both at 20 feet and at near. These exercises seem to me to succeed particularly well when there is an associated weakness of accommodation; the latter is also thereby stimulated.

4. The use of prisms for exercising the convergence presupposes ability to recognize diplopia and to fuse double images. If the patient is deficient in either regard, we shall secure better results with the amblyoscope. The way to use this is, first, to get the patient habituated to seeing with the two eyes together, that is, to set the instrument in such a way that he clearly makes out two distinct images. The second step is to habituate the patient to seeing with both eyes when the images are brought close together, and finally to adjust the tubes so that the two images are superimposed and actually fused. The third step is to make the patient practice convergence after the images are thus fused, that is, to urge him to swing the tubes toward each other while still maintaining fusion. The successful carrying out of these different stages of the practice may take weeks or months.

For the proper carrying out of this practice, the amblyoscope should have a suitably graduated arc, so as to measure the position of the tubes and register the amount gained by exercise, and also a vertical adjustment to correct the hyperphoria that is not infrequently present.

Fusion may also be exercised usefully with the stereoscope and with bar-reading.

5. Another way, besides the amblyoscope, of getting the patient to recognize the fact that he sees double and to pave the way to the use of converging prisms, is to separate the images widely by prisms, or to make the images dissimilar by using a red glass before one eye and a green glass before the other. Systematic exercises at home of this sort may usefully precede exercises with prisms, base out.

6. The use of prisms, base in, to correct the deviation is in my belief a procedure to be condemned. Affording a temporary relief, it has seemed to me that in most cases such prisms ultimately increase the deviation and the symptoms, too. On the other hand, the correction of a coexistent hyperphoria by prisms, base up or down, may afford considerable relief to the symptoms and make the lateral deviation much more manageable by ordinary means.

7. Operation should not be done unless all other means have been thoroughly tried and have failed and unless also the symptoms are severe and likely to be permanent. In a simple convergence insufficiency, advancement or tucking of the internal recti is indicated. It may or may not be combined with tenotomy of the external rectus, but if we are dealing with a simple convergence insufficiency, the tenotomy should not involve the lateral attachments of the tendon and should be done to such an extent only as to relax the strain on the advanced muscle. If there is well-marked divergence excess, free tenotomy of the externus should be combined with the advancement of the internus.

It is best to operate on one eye and from four to six weeks later operate on the other if necessary.

If there is a considerable vertical deviation this should in general be relieved by operation before any attempt is made to operate for the lateral displacement. Otherwise the lateral displacement is liable to recur, and on the other hand, if the vertical deviation is corrected first, it may happen that the lateral deviation may not need correction at all.

139 East Thirty-Seventh Street.

ABSTRACT OF DISCUSSION

DR. WILLIAM N. SOUTER, Portsmouth, N. H.: I would not use the centrad in prism measurement. I have no criticism to make of the centrad in itself, but the prisms in our trial cases and those kept in stock by opticians are not made on the centrad scale; and since I know of no advantage which the centrad has over the prism diopter, I think it is better to use the latter, the generally adopted unit. It is true that the centrad and the prism diopter are so nearly equal in value that no error is ordinarily made by designating in centrad prisms which are manufactured on the diopter scale, but in the very strong prisms an amount of error is ignored, which, though not serious, is yet not in accord with Dr. Duane's usual accuracy. A prism of 50 prism diopters corresponds to 46 centrads. My second point of disagreement with Dr. Duane is as to the amount of convergence which is to be regarded as normal. He makes a diagnosis of convergence insufficiency if the person cannot converge to a point 9 cm. from the intercentral base line, or, on an average, about $2\frac{1}{2}$ inches from the root of the nose. I do not think so great an amount of convergence is required for comfortable use of the eyes in ordinary near work. I should hesitate to ascribe to convergence insufficiency any symptoms which might occur in a person who could converge to a point 12 cm. from the intercentral line, 4 inches from the root of the nose. Thirdly, I do not believe that prism exercises or convergence exercises are a rational procedure. I say this, though I am aware that I am in this respect at variance with the majority of ophthalmologists. I believe that, aside from the psychic effect, nothing whatever is gained by this method. I have reached this conclusion partly from my own early experience, partly from the results which I have seen in patients who have undergone this kind of treatment under the direction of competent advocates of such exercises, and partly from my conviction that it is unreasonable to expect these exercises to accomplish what cannot be accomplished by the normal stimulus afforded by the ordinary use of the eyes in near work. Finally, I believe

that prisms, bases in, are of great value for permanent wear in cases of uncomplicated convergence insufficiency. In many of these cases there is some innate peculiarity which renders convergence difficult, and the slight assistance afforded by the prisms is sufficient for comfortable use of the eyes. I have patients who have been wearing such prisms for many years with permanent relief.

DR. FRANCIS VALK, New York: I wish to speak only with reference to when and how to operate in these cases of what I call exophoria or the convergence insufficiency of Dr. Duane. I fully agree with him concerning the treatment of these cases—the only ones, in my opinion, suitable for prism exercise—but when we have passed that stage we must consider an operation. Dr. Duane has placed this as the last procedure; but we see these cases after all other means have failed; then why not operate at once? If we have a low degree of exophoria they may be improved by other means, but if we have an exophoria of more than 3 degrees it seems to me that all these attempts to improve the motive power of the interni will be useless, and that operation must come. If that is correct, and all tests, both subjective and objective, show a high degree, then operate. I plead for early operation because I think the day of tenotomy has passed, and when we can do a simple and effective operation that always gives relief, never gives an overcorrection, and can be performed under cocaine, that procedure which is now offered to the profession in more than ten different methods, should be the operation of choice. I refer to the well-known operation of shortening the tendon of the weak muscle. Furthermore, Dr. Duane says, "Operate on one eye and in three or four weeks operate on the other." Which eye, however, shall be operated on first? This is to me a very serious and important question, as I have seen many failures from tenotomy. If you operate on both you may get the right one, but is that correct? Is the fault equally present in each eye? Hence, if we can place our weak muscle in insufficiency or in excess, is it not essential to shorten the weak muscle before any attempts to do a tenotomy? I have followed this rule for many years and seldom do more than one operation, when I follow the readings of the tropometer; and, as Howe says, this instrument is the keynote and indicator of all operations on the muscles of the eye.

DR. D. W. WELLS, Boston: With regard to the treatment of insufficiency, under Head 4 as given by Dr. Duane, I should like to make a plea for the more constant use of the stereoscope. Dr. Duane has said that many cases could not be well trained by prisms, because the patients do not quickly recognize diplopia. It seems to me, therefore, the logical procedure would be to carry on some course of educative treatment which would teach the patient to recognize diplopia, and nothing is better for this than to train the fusion faculty. Simple testing with the stereoscopic charts will show that most of these patients tend to suppress one eye more quickly than the other as soon as the test-letters become small. Now the use of the stereoscope with charts which will increase the patient's fusion faculty is one of the best means of teaching him to overcome this insufficiency. The power of a muscle, it seems to me, depends not alone on its size, but also on the innervation which goes to the muscle, and this depends on the development of the fusion faculty, and varies in different individuals. Therefore my plea is for the development of the fusion faculty by means of the stereoscope and also by constant bar and control reading which Dr. Duane simply mentioned. This can be carried out quite systematically and the patient himself can see the value and advantage of properly using his fusion faculty.

DR. EDWARD JACKSON, Denver: One or two points have been raised that deserve emphasis. Of treatment, Dr. Duane puts first and emphasizes correction of errors of refraction. Errors of refraction are a more frequent cause of some symptoms of convergence insufficiency than is convergence insufficiency itself; but real convergence insufficiency is probably caused by efforts to overcome errors of refraction. We all understand how myopia, preventing the normal use of accommodation, may lead to convergence insufficiency; but other errors of refraction—astigmatism, and particularly

anisometropia—may disturb the coordination of ocular movements; and, as Dr. Duane points out, this is the essential fault in convergence insufficiency. I use prism exercises very little. I see many cases in which, I think, they are used foolishly and uselessly. Yet as this trouble is a disturbance of coordination, we may sometimes bring about better coordination by breaking up the old habits; and I know of no more direct and effective means of doing this and improving the coordination of the ocular movements, than by exercising them with prisms as has been recommended. The centrad departs from the prism diopter, when the prism diopter departs from conforming to the requirements of a scientific unit. As long as ten prism diopters are ten times one, the two go together; but when the 50 prism diopters are only 46 times the one prism diopter, then the prism diopter departs from being a scientific unit and from the centrad. In practical use I never saw a trial case in which the prisms ran above 30 centrads; but when we get up to the higher degrees of deviation, 60, 80 or more centrads, then the prism diopter is a very inferior unit of deviation.

DR. MARK D. STEVENSON, Akron, Ohio: For a number of years I have been examining for insufficiency, in all cases; some of it is frequently found. The practical point is that we should be careful in determining the distance in selecting lenses for close work for such patients. Unless the vocation demands a special near point, we should give lenses with which the patient can see at a fairly good distance. Strong lenses, making him read at a very close distance, especially in people with great pupillary distance, give added work for the adductors. Often the last straw is what counts and if only a little assistance is given the patient is relieved. I found also in a series of tests, made years ago, in examining in different positions in the field with a small point of light and Maddox rod, which of course is not perfectly exact, that the insufficiency was different in degree straight ahead or to one or the other side. I found I could relieve some of these patients by causing them to hold the reading-matter to one side. They could converge better to one side than to the other, just as we have trained ourselves in school to have the books to one side. Some of these patients are probably slightly parietic from various toxemias, the cure of which will give relief. In anisometropia it is often important that the patient hold the reading-matter in a particular place, to one side, or up or down or with the head held in a particular position. We should all realize the importance of muscle training; it does not matter that before muscle training we have for example 9 degrees of lack of balance and afterward the same. If we have stronger muscles to overcome the insufficiency the patient may be rewarded with relief from symptoms. The muscle exercises may need to be repeated, but if it gives a patient months of ease and relief, that is the purpose of our calling.

DR. GEORGE H. PRICE, Nashville: The definition of the condition given by Dr. Duane in the second paragraph of his paper reduces it to one ordinarily known as asthenopia, and the question is as to the best method by which we can combat these symptoms of insufficiency. I was struck by the suggestion of Dr. Stevenson that when some of these patients held the book in a certain position they would be relieved in great measure of the discomfort of the insufficiency. This is a point of great significance. When we have insufficiency of the internal recti we are dealing with a muscle not sufficient in strength to overcome the opposing muscle, and this is because in every individual the musculature varies. The innervation of the internus is almost from the same source practically as that of the superior and inferior recti and the inferior oblique and the coordinate muscles of accommodation. Therefore that has a great deal to do with it. If you have bad accommodation then you have the complication of the deficiency of the internal recti, or of the involvement of the ciliary muscle. All these things must be considered in correcting the vision. The amount of accommodation is indicated by the patient. If all the muscles of the eye are low in their muscular strength, then it would be impossible to go ahead and strengthen one pair of muscles. It would not be desirable; but we would exercise all of them. The simplest

method of doing that is by the ceiling-to-floor and wall-to-wall method. If the patient has low accommodation and insufficiency of the internal recti, a little exophoria and considerable hypermetropia, I know he will have trouble.

DR. OSCAR WILKINSON, Washington, D. C.: Exophoria for near is a normal condition. I have for the past three years, in all presbyopic cases, examined for near and I would say that at least 90 per cent. will have exophoria for near of at least 3 to 5 degrees. So I do not think we should assert that exophoria of 4 or 5 degrees is abnormal. It does not really demand any attention. I would also like to concur with Dr. Duane with regard to the slight changes that the correction of the refractive error makes on these muscular defects. I thought at one time it probably had a great deal to do with that, but after studying a great many cases after the glasses had been worn I find there is practically no change in the muscular balance due to the correction. He also notes another thing which I have noticed, that right hyperphoria is much more frequent than left. In the cases which Dr. Duane called paresis I have found electricity to have a markedly beneficial effect, and I think we are neglecting a valuable therapeutic agent if we do not use it in recent cases. I also use tincture of *nux vomica* internally.

DR. ALEXANDER DUANE, New York: Dr. Souter thinks I have placed the convergence near point too close. I should have thought so too, had I not made a series of measurements which seem to show that the distances ordinarily assigned are too remote. A convergence near point beyond 9 or, at any rate, 10 cm. from the base line connecting the centers of the two eyes I consider too remote, and if constantly present indicates a convergence insufficiency. With regard to exercise with prisms, base out, in convergence insufficiency, I think a good deal depends on how they are used. If the exercise is made with the object at 20 feet we may not only do no good but may do harm. I am a little more chary of doing operations than Dr. Valk, and yet I recognize the good results from his tucking operations. He asks how we are to determine which eye to operate on first. I should select the eye which in the act of converging regularly diverges and which also shows, as it is apt to do in cases requiring operation, a demonstrable secondary weakness of the internal rectus. I agree with Dr. Wells as to the value of the stereoscope and bar reading, and I find his stereoscopic card very valuable. Dr. Stevenson makes a point about convergence insufficiency in presbyopia. He will find on referring to my article that he and I are in substantial agreement—that is, if I understand him aright.

SUMMARY OF RESEARCH STUDIES IN PSORIASIS*

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PHILADELPHIA

During the past two years we have had, through the generosity of a benefactor, the opportunity of prosecuting an inquiry into the cause and nature of psoriasis with the purpose of better enabling us to treat this prevalent and obstinate disease of the skin. This work has been carried out in specially equipped laboratories and with all possible thoroughness. Psoriasis

is a disease that has been known since the days of the early Greeks, who characterized it by the name of "lepra." Despite the fact that it constitutes from 4 to 5 per cent. of all skin-diseases, the nature of the disease has remained thus far an enigma. Many theories have been advanced to explain its pathogenicity, but none has been satisfactorily demonstrated to be true. The three most prevailing views with regard to psoriasis are that (1) psoriasis is due to a parasite, (2) psoriasis is a disease resulting from disturbed metabolism, and (3) psoriasis is a disease of neuropathic origin. The last view referred to, while advocated by some men of prominence, has relatively little to commend it.

We have concentrated our activities in investigating psoriasis along two particular lines of inquiry—bacteriologic and metabolic. We have labored assiduously during the period of our investigation to find some micro-organism in the scales, serum, skin and blood of patients suffering from psoriasis, but we have thus far been unable to discover any micro-organism which could be regarded as bearing an etiologic relationship to the disease. Twenty-two different microbes have been isolated by us from psoriasis scales and have been individually studied with a view of determining their special characteristics. Complement-fixation tests have been carried out with groups of these organisms with entirely negative results. We have likewise made up vaccines with the isolated bacteria, but have failed to produce any effect on psoriasis by their use. The ultramicroscope and all sorts of special culture mediums have been employed without materially aiding us in elucidating the cause of psoriasis. We have not abandoned the bacteriologic study of psoriasis, but up to the present time it may be said that no germ has been found which could be regarded as bearing a causative relation to the disease.

-METABOLIC INVESTIGATIONS

During the past two years we have investigated the metabolism of about a dozen patients suffering from psoriasis. Obviously, that which first commanded our attention was the protein metabolism. We have carried out investigations of the nitrogen balance in patients for long periods of time under the most rigid conditions. The food received by patients was analyzed and weighed, and the nitrogen in the urine and feces was carefully determined. The scales were collected with as much care as possible and their nitrogen content likewise determined. In one instance the perspiration was collected for certain periods of time and subjected to analysis. The patients were housed in private rooms and were under the care of a special trained nurse. Our patients were studied for periods varying between forty and 168 days.

In all our studies of the protein metabolism, attention was paid to possible qualitative disturbances as well as quantitative. The distribution of the urinary nitrogen was therefore studied in most of the cases. Our patients were kept on diets containing definite quantities of nitrogen and a definite caloric value. The total nitrogen intake was compared with the total nitrogen output and balances established.

Our work was not very far advanced when we began to realize that we were dealing with a disease the subjects of which suffered from a peculiar disturbance in protein metabolism. We learned very soon that these patients possessed the power of retaining rather large quantities of nitrogen on diets on which

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normal persons would just maintain equilibrium. The giving of a diet containing large quantities of nitrogen (about 20 gm. a day) was followed by an enormous retention of nitrogen. And what is perhaps more important, on a very low-nitrogen diet, that is, a diet containing about 4 gm. of nitrogen a day, on which a normal person can hardly maintain equilibrium or at best do so with great difficulty, the psoriatic patient has the power of so altering his protein catabolism as to maintain equilibrium with perfect ease. The psoriatic patient possesses the power of reducing the urinary nitrogen output to a level lower than has ever been recorded in the studies of protein metabolism.

Clinically, we noted a very definite relationship between the protein metabolism and the course of the eruption. In the active stages of the disease, a high-protein diet brings about a spread of the eruption; conversely, a low-protein diet is followed by improvement even when no local remedies are applied.

Two questions presented themselves as soon as these facts were recognized:

- 1. What is the nature of the relationship between the protein metabolism and the psoriatic processes of the skin?
- 2. What is the cause of the nitrogen retention observed in psoriatic patients?

We believe that answers to these questions may be found in the consideration of the following:

One of the most prominent features of the psoriatic lesion is the rapid proliferation of the epithelial cells. These cells become cornified and are thrown off as scales. Repeated analysis has demonstrated that these scales are composed almost entirely of pure protein; in severe forms of psoriasis very large quantities of scales may be exfoliated, entailing the loss of considerable amounts of protein material. The epithelial cells for their life and growth require large quantities of building material in the form of protein, which can come from only one source, the blood and lymph.

It is a well-established fact that the growth and multiplication of cells depends directly on their "growth impulse" or *Wachstumstrieb*, and that the velocity of their growth can be regulated entirely by the amount and character of "building material" placed at the disposal of these cells.

It becomes evident, therefore, that any diet which will tend to increase the concentration of amino-acids in the blood and lymph will tend to accelerate the growth and multiplication of these rapidly growing cells. A high-protein diet strongly favors the spread of the psoriatic lesions, because it causes an increase in the concentration in the blood of the various building materials, and places at the disposal of the psoriatic cells a plentiful supply of nutrient material.

A low diet, on the other hand, appears to influence the psoriatic lesion in just the opposite way. The concentration of amino-acids does not rise above the normal, and what is perhaps more important, the protein catabolism is reduced to the lowest level possible.

No harm whatsoever is caused by keeping a patient on a very low-protein diet for a long period of time, provided the caloric supply is sufficient to maintain the patient's body-weight. Chittenden for a number of years has advocated the advisability of keeping man on a 6-gm. level of nitrogen, and Hindelhede has shown that nitrogen equilibrium and mental and physical efficiency can be maintained for long periods of time on diets containing even less nitrogen.

In the accompanying table are given different type diets which we have employed in the treatment of our psoriatic patients. They contain from 4 to 5 gm. of nitrogen and sufficient calories to cover the needs of a man doing a moderate amount of work. In hard-working persons additional butter and cream can be added. Our patients were allowed plenty of sugar, and in some cases candy was given between meals.

TYPE OF REGIMEN FOUND TO BE MOST BENEFICIAL IN PSORIASIS

DIET 1				
Food	Amount, gm.	Nitrogen, Per Cent.	Nitrogen, gm.	Calories
Breakfast—				
Bread	20	1.55	0.31	53
Butter	15	0.12	0.02	113
Grape-Nuts	10	1.96	0.20	40
Orange	180	0.128	0.23	83
Apple	135	0.064	0.09	77
Tea	125	0.015	0.02	..
Cream	30	0.336	0.10	57
Total .....	...	.....	0.97	423
Lunch—				
Bread	15	1.55	0.23	39
Butter	15	0.12	0.02	113
Grapes	150	0.208	0.31	129
Lima beans	50	1.21	0.60	37
Turnips	75	0.118	0.09	31
Corn-starch	189	0.065	0.12	297
Potato-cake	300	0.275	0.82	273
Tea	125	0.015	0.02	..
Total .....	...	.....	2.21	919
Supper—				
Bread	25	1.55	0.39	66
Butter	15	0.12	0.02	113
Prunes	88	0.08	0.07	63
Cauliflower	75	0.338	0.25	22
Corn	100	0.386	0.39	95
Celery	25	0.176	0.06	5
Potatoes	200	0.255	0.51	182
Total .....	...	.....	1.69	546
Total for day .....	...	.....	4.87	1,888
DIET 2				
Breakfast—				
Bread	20	1.81	0.36	53
Butter	15	0.12	0.02	113
Grapefruit	146	0.13	0.19	67
Banana	99	0.208	0.21	87
Puffed rice	10	1.17	0.12	36
Cream	30	0.397	0.12	57
Total .....	..	.....	1.02	413
Lunch—				
Bread	16	1.81	0.29	42
Butter	15	0.12	0.02	113
Corn-starch	153	0.138	0.21	236
Cabbage	75	0.198	0.15	22
Lima beans	75	0.789	0.59	55
Potato-cake	250	0.323	0.81	277
Total .....	..	.....	2.07	695
Supper—				
Bread	25	1.81	0.45	66
Butter	15	0.12	0.02	113
Lettuce	25	0.192	0.05	5
Beets	100	0.17	0.17	37
Corn-meal	125	0.246	0.31	188
Prunes	86	0.08	0.07	62
Sweet potatoes	100	0.216	0.22	195
Cream	20	0.397	0.08	33
Total .....	..	.....	1.37	704
Total for day .....	..	.....	4.46	1,812

These two diets give an idea of the way dietaries of this nature can be arranged, without losing sight of the necessity of a certain amount of variety in the menu. Oysters and ice-cream may be added to the diet, as they contain very little nitrogen. During the spring and summer when berries and fresh vegetables are plentiful, these diets can be made more varied.

For patients who are up and about attending to their business, it would be advisable to have them submit their twenty-four-hour specimen of urine about once a week for analysis. The urine, if the patient adhered rigidly to the dietary prescription, should not contain more than from 3.5 to 4 gm. of nitrogen. If it contains more it is safe to assume that the patient is not

living on the prescribed diet. Early recognition of this fact will be of service to both the patient and the physician.

There are many dermatologists who state that they have tried dietary restriction in psoriasis, but have failed to observe the beneficial results claimed for this method of treatment. It should here be stated that the more severe and wide-spread the eruption the more readily will it be influenced by appropriate diet, and on the contrary, the more limited the eruption the more difficult will it be to influence it by diet alone. We have tested the influence of diet under most critical conditions and we feel fully justified in stating that the eruption of psoriasis may be favorably or unfavorably influenced by variations in dietary regimen. We have not failed in a single instance to bring about marked improvement in our research patients by diet alone. We are free to admit that outside of the hospital our results have been much inferior to those obtained with hospital patients, for the latter are supplied with the exact kind of food in measured quantities.

It is necessary, to secure the best results, that the diet should not contain more than 5 gm. of nitrogen a day. Very few private patients who are not given detailed instructions as to the quantity of the various foodstuffs to be taken will reach so low a level. Such a low-protein dietary may be difficult for those with epicurean tastes to content themselves on; our patients, however, lived on a regimen of this character for many weeks without complaint.

We have no doubt that many patients with severe and obstinate psoriasis eruptions would be willing to adhere to such a diet to secure a disappearance of their eruption. How long it is necessary or desirable for a psoriatic patient to continue this rigid diet we are not quite prepared to say. We have found that several weeks of this regimen will usually alter the reactivity of the skin to external medicaments, so that an eruption which is too inflammatory to permit of the use of chrysarobin or other strong applications in the beginning, afterward will yield readily to such local treatment.

One of our patients who had a universal psoriasis has remained practically free for a year by adherence to a diet similar to that on which she subsisted in the hospital. The more nearly the diet approximates the type of diets referred to above, the more quiescent will the psoriatic process remain.

It may, however, be undesirable by reason of the condition of the patient's nutrition and general health to continue on such a diet too long. We have reason to believe that a low-nitrogen intake may favorably influence other wide-spread dermatoses. We have cured a rebellious case of exfoliative dermatitis of two years' duration and have seen striking improvement in a case of chronic generalized eczema and in a case of dermatitis herpetiformis while under this treatment, the two latter patients using no local treatment to speak of.

In psoriasis, dermatitis exfoliativa and allied conditions in which there is a great multiplication and a casting off of the epithelial cells, the low-protein diet seems to quiet down the condition by a process of epithelial cell starvation. Sweet, Corson-White and Saxon have shown that inoculation-tumors of mice and rats may be similarly influenced by a very low-protein diet.

THE GERMICIDAL PROPERTIES OF CHRYSAROBIN AND CERTAIN OTHER REMEDIES

In 1877 an Englishman, Keith, first employed chrysarobin in the treatment of psoriasis. The drug had been previously used by Balmanno Squire of London, in the treatment of ringworm of the scalp. Chrysarobin is a remarkable substance which exerts a powerfully beneficial and rapid influence on the patches of psoriasis. No other drug can be compared with chrysarobin in its rapidity of effect. In many cases it acts almost as a local specific. The drug is derived from the woody fiber of the *Andira araroba* tree, the crude product being known as Goa powder. From almost time immemorial the natives of Brazil have employed this powder in the treatment of skin-diseases.

It was thought profitable to investigate the germicidal activity of chrysarobin and certain other medicaments employed in psoriasis with a view of shedding collateral light on the nature of the disease. It is obvious that if chrysarobin proved to be powerfully



Fig. 1.—Extensive psoriasis eruption.

germicidal, this fact would aid in interpreting its effect on psoriasis patches. If, on the other hand, chrysarobin possessed only feeble or no germicidal power, such facts would likewise be helpful in offering a solution of its mode of action. In our investigations difficulty was experienced at the outset in determining the germicidal power of chrysarobin because this drug is insoluble in water. The Rideal-Walker and the Hygienic Laboratory methods of determining the germicidal power of drugs apply only to substances which are soluble. We were therefore obliged to devise a method of determining the germ-killing power of insoluble substances. By a stroke of good fortune, we selected calomel as a standard. We have already published¹ a note on the germicidal activity of calomel. We found that calomel, as well as other mercurials, possessed, *in vitro*, the most powerful germ-destroying influence of any known drugs. Weight for weight,

1. Schamberg, J. F., and Kolmer, J. A.: The Germicidal Activity of Calomel, *THE JOURNAL A. M. A.*, June 20, 1914, p. 1950.

calomel was found to be just as germicidal as mercuric chlorid. This is all the more remarkable when one considers the insolubility of the former. Having determined that insoluble substances were capable of destroying bacterial life in solid mediums in the Petri dish, we were enabled to test out the activity of chrysarobin and certain allied substances. Chrysarobin in the highest amount used (120 mg. or 2 grains in 10 c.c. of bouillon) failed to restrain bacterial growth. We have furthermore incorporated chrysarobin in various culture-mediums in such excess that the powdered drug floated on the surface of the medium and yet staphylococci and the ringworm fungus were capable of producing a flourishing growth on such mediums. We have supplemented this study by various other investigations, all of which confirm the fact that chrysarobin possesses but feeble or no germicidal action.

We do not feel as yet justified in drawing any definite deductions from these facts, but merely desire to



Fig. 2.—Same patient ten weeks later, showing improvement in eruption as a result of low-protein diet. No internal treatment and no external applications whatsoever.

state our findings. Chrysarobin, the most powerful and efficacious drug known in psoriasis, has practically no germicidal power. Calomel, on the other hand, which we have found to be highly germicidal and capable of destroying the cocci in the skin, has but a feeble effect on the patches of psoriasis.

THE BIOCHEMICAL ACTION AND CHEMOTHERAPEUTIC STUDIES OF CHRYSAROBIN AND ALLIED SUBSTANCES

We have endeavored to determine the changes which take place in the skin when chrysarobin and certain allied products are applied. It is a well-known fact that chrysarobin produces a curious mahogany-colored discoloration of the skin which lasts until an exfoliation of the stained horny cells takes place. It would appear that the greater the degree of staining, the more beneficial is the effect of the drug on the disease. We have shown by a series of experiments,

which will be detailed at full length elsewhere, that chrysarobin has a powerful affinity for certain elements of protein. Indeed, the staining of the scales by chrysarobin produces a firmer union than the staining of the scales by any known anilin dyes. The staining of the skin appears to be intimately associated with the process of oxidation. Chrysarobin is powerfully reducing, and in undergoing oxidation, abstracts oxygen from the protein of cells, for we have demonstrated that the oxidation can go in the absence of air in a hydrogen atmosphere. We believe from our experiments that the effect of chrysarobin is in large part due to two influences: (1) the firm union with the protein of the epithelial cells and (2) the abstraction of oxygen. It is quite possible that this may explain the favorable influence of the drug in psoriasis, for the action referred to may restrain the great proliferative activity of the epidermal cells which characterizes this disease.

Some investigators, chief among whom was Unna, maintained some years ago that chrysarobin produced its favorable influence in psoriasis by abstraction of oxygen, the drug being oxidized into chrysophanic acid, a reddish-brown substance. The investigations which we have carried out seem to support the view that the reducing power of chrysarobin is of great importance in influencing its therapeutic efficacy. As has been stated, this action and the remarkable chemical affinity of chrysarobin for protein, particularly for the keratins of the skin, appear to us to be in large part responsible for the beneficial influence of this drug. Psoriasis scales which are incubated with a watery suspension of chrysarobin at 37 C. (98.6 F.) are deeply stained by the drug. The chemical combination is so firm that it is impossible to remove its coloration even by prolonged boiling with glacial acetic acid. The chemical combination of chrysarobin with protein is apparently stronger than that of any known anilin dye.

Recent investigations into the chemical constitution of chrysarobin have revealed the fact that it consists of a number of chemically allied substances. Following the work of certain other chemists, we have isolated the two important ingredients of chrysarobin, chrysophanol-anthranol and emodinol. We have tried out these substances clinically and have found that emodinol exerts no therapeutic effect whatsoever, while chrysophanol-anthranol has a favorable influence, but inferior to that of crude chrysarobin. We then tried to isolate by fractional extraction the therapeutically active parts of chrysarobin; the fractions, however, were always inferior to the whole drug. Compounds of chrysarobin in which the hydroxyl group was combined with the acetyl radical, acetylchrysarobins, were prepared by us and tested out therapeutically. We found these compounds likewise inferior to chrysarobin. A number of other compounds prepared by us in which the hydroxyl groups of chrysarobin were partially or completely oxidized were therapeutically of little or no value; in general, it can be stated that any change in the chrysarobin molecule affecting the hydroxyl groups diminishes the therapeutic activity on the skin. We have produced a certain derivative of chrysarobin in which the hydroxyl groups appear to remain unaltered which has greatly interested us. This new drug has been tried out by ourselves and other dermatologists to whom it has been supplied, and the general feeling is that it is superior to chrysarobin. It is also preferable to chrys-

arobin in that it is much cleaner and freer of disagreeable staining properties. The mode of standardizing the preparation of this drug has not been satisfactorily concluded by us, and we shall therefore delay publication on this matter until a later date.

ABSTRACT OF DISCUSSION

DR. WILLIAM A. PUSEY, Chicago: I confess to the same skepticism concerning the value of a low protein diet in psoriasis that has been shown previously in discussing this subject. I am unable to reconcile the remarkable accumulation of nitrogen in these patients with the law of the indestructibility of matter, nor am I convinced that in eliminating from the diet protein we have solved the problem of the treatment of psoriasis. I admit that a reduction of the protein intake as well as in the quantity of food in general is a factor in the improvement that has been observed in these cases; and I also believe that the decrease in protein is more important than the decrease in the general diet; but a long and unhappy experience with psoriatic patients, who have been dieted most vigorously with food of a low protein content, has convinced me that in the diet we have but one factor in the etiology of this affection of the skin.

DR. G. W. RAIZISS, Philadelphia: As chrysarobin has long been known to give good results in psoriasis, it was interesting for us to learn more about the nature of the chemical processes which are involved in the action of the drug on the skin. Unna maintains that the favorable action of chrysarobin on the skin in this affection is due to the abstraction of oxygen from the cells of the skin, but this theory was never supported by experimental work. Our own experiments rather support the view of Unna that the reducing power of chrysarobin has something to do with its favorable influence on psoriatic lesions, but we found another important property in the drug, namely, that it had a remarkable chemical affinity for protein, especially the keratin elements of the skin. We applied a chrysarobin ointment to the skin of a rabbit, and after several days, when this section of skin was excised, it was found to be deeply stained with a chrysophanic acid-like color, and we could not separate the acid from the skin by any method which we employed. We also found that this staining could be accomplished by mere suspension of the drug in water, and again we could not remove the stain from the skin. This shows that chrysarobin has probably a remarkable chemical affinity for proteins, and that it apparently acts by precipitating the cell and robbing it of its vital properties by absorbing important proteins. Recent studies of chrysarobin show that it is not a single definite chemical compound; it consists of a number of chemically allied substances, and it was our aim to isolate some of these with the object of finding a principle which would be superior to the commercial drug. While none of the constituents of chrysarobin appeared to be of greater therapeutic value than the entire drug, one of many derivatives of chrysarobin, which were prepared by us and tested on the skin, gave good results. This substance is still the object of chemical and clinical studies.

DR. JOHN A. KOLMER, Philadelphia: Those of you who have done any work along these lines are aware of the fact that many varieties of cocci and diplococci are found in these lesions. We have not been able to identify any one of these as the active agent in psoriasis. The difficulties surrounding the work are increased because psoriasis is apparently not transmissible to the lower animals. Our results along these lines have thus far been negative. During the past year we have been mainly interested in studying the action of chrysarobin on psoriatic lesions and determining whether the drug had a germicidal action on any of these micro-organisms. We have been able to grow cocci from psoriatic lesions in chrysarobin, showing that it has a very weak if any germicidal influence. This fact has been corroborated by control experiments. Calomel is absolutely insoluble in water, yet we found that this drug has a remarkable

germicidal activity, equal to mercuric chlorid, and capable of killing organisms directly on the skin. This drug, however, has no recognized value in the treatment of psoriasis, and we have become convinced that chrysarobin does not act by any direct germicidal action on micro-organisms in psoriatic patches. It is probably by gradual deoxidation that chrysarobin destroys a micro-organism in psoriatic patches; what that particular micro-parasite is, is something yet to be discovered.

DR. WILLIAM S. GOTTHEIL, New York: How far was Dr. Schamberg able to carry his protein-free diet, and how long could he keep it up? Personally and in private practice I have found that the limit was soon reached; two weeks has been the longest that I have ever been able to keep a patient on it, and not with a very strictly protein-free diet at that.

DR. S. POLLITZER, New York: My own experience with a relatively low protein diet in psoriasis has not been so fortunate as that of Dr. Schamberg. Within the past year I have tried it in ten cases in private practice, all intelligent patients on whose word I could rely, who were kept on a diet as nearly free from nitrogen as it was possible to enforce, though, of course, they were not under hospital supervision. I am satisfied that they faithfully followed the prescribed diet, which excluded even peas and beans. None of these patients showed anything like the improvement reported by Dr. Schamberg: in fact, three of them developed new lesions in the third week of this diet. My own experience has been duplicated by many others, though that of Dr. Schamberg is by no means unique, and it is rather curious that such radically different results should have been obtained by different observers. I can only repeat my conviction, that there is some error in these findings. To take the most striking case: A girl of 40 kilos (88 pounds) "retained" 400 gm. of nitrogen during the four months of the experiment and actually weighed a little less at the end of the period than when she began. In other words, about 25 pounds of protein which this patient ingested has disappeared; it has not passed out again and, as her weight proves, it has not remained in her. I must insist that such a result is not only a contradiction of the laws of metabolism, but even a violation of the fundamental principle of the indestructibility of matter. The case which Dr. Schamberg presents as an answer to Tidey's criticism, that the authors' error lay in a failure properly to collect scales, proves too much. This psoriatic, who did not desquamate, also "retained" nitrogen. Now, the authors have explained the nitrogen "retention" as due to a specific nitrogen-hunger caused by the loss of protein in the scales. But here is a case that does not scale, cannot therefore have a specific nitrogen-hunger and yet "retains" nitrogen! A large positive nitrogen balance over a prolonged period without a corresponding gain in weight is in itself a proof of error in the observations.

DR. JAY F. SCHAMBERG, Philadelphia: Replying to Dr. Pollitzer, lack of time forbids me to enter into detail to prove that the figures presented present no inconsistency. Passing to another criticism, physiologic chemists are agreed as to what constitutes a nitrogen retention, and we have employed the term in the manner in which it is universally used by chemists. The chemists associated with me in our research are convinced that the results we have reported are not only possible but also correct. One who is a dermatologist and not a chemist is not warranted in branding the results as impossible and out of accord with physiologic chemical principles. In presenting these results, we have no theory to suggest or prove. We entered into this investigation with entirely open minds. I was at the outset skeptical as to the influence of diet in psoriasis, but I have been convinced practically against my will. Psoriasis may ultimately be proved to be a disease of purely parasitic origin. We are not advancing hypotheses as to the cause of the disease: we are presenting our laboratory and clinical findings and we place them before you for what they are worth, and for your careful consideration.

WHITE-SPOT DISEASE*

GEORGE M. MACKEE, M.D.

AND

FRED WISE, M.D.

NEW YORK

The designation "white-spot," as applied to a definite clinical entity referable to the skin, was first employed by Westberg in 1901. He used the term "white-spot" merely as a descriptive adjective, qualifying a supposedly unknown dermatosis. In 1903, Johnston and Sherwell published the second paper on the subject, giving it the title of "White-Spot Disease." In this paper reference was made to Westberg's case and to Montgomery's case of white-spot disease which was exhibited before the American Dermatological Association in 1901, a report of which case was later published in full. Sherwell subsequently exhibited another case of this disease before the New York Dermatological Society in 1904. By that time a number of dermatoses, characterized by the presence of white spots of one kind or another, were reported in the dermatologic literature of America and Europe.

During the past ten years a very substantial literary structure has reared itself on the foundations of Westberg's and Johnston and Sherwell's papers. A careful and thorough perusal of the writings on the subject



Fig. 1.—The two lesions on the penis. Note the annular appearance, due to the snow-white border and the mother-of-pearl or bluish-white center. Note, also, the crenated border.

of white-spot disease has given us the impression that the cases deserving to be placed in the same category with those of Westberg, and Johnston and Sherwell are by no means numerous. Highly instructive and interesting contributions to the subject have been rendered by some of the master minds of dermatology both here and abroad. Of these dissertations, however, valuable as they are, only a few actually deal with the subject of so-called white-spot disease.

As is the case with so many other unclassified dermatoses in which the etiology is purely conjectural, the clinical picture not clearly defined and even the microscopic changes more or less obscure and difficult of interpretation, the study of white-spot disease has led investigators far afield in their attempts to place it into its fitting nosologic position with relation to allied cutaneous changes. Thus, in the excellent contributions of Vignolo-Lutati, Riecke, Hazen, Petges and others, we find that these authors evidently considered it necessary, for a thorough presentation of the subject, to digress considerably from the main

theme. For they deal not only with white-spot disease *per se*, but also with morphea guttata and scleroderma circumscriptum, as well as the card-like scleroderma of Unna, the lichen albus of von Zumbusch, the lichen planus atrophicus and sclerosus of Hallopeau, the dermatitis lichenoides chronica atrophicans of Csillag, the neurodermatitis alba of Kreibich, the nevus anemicus of Voerner, the multiple keloids with scar-like atrophies of Jadassohn, the white, atrophic and scar-like perifollicular spots on the trunk of Iwanow, the morphea with maculae atrophicæ of Duhring, the circumscribed scleroderma of Zarubin, the white spots found in various chronic diseases such as leprosy, dermatitis herpetiformis and a number of other morbid cutaneous processes of more or less remote relationship to white-spot disease.

We have read and studied the entire literature relating to white-spot disease and have found it necessary to write an article of sixty-five typewritten

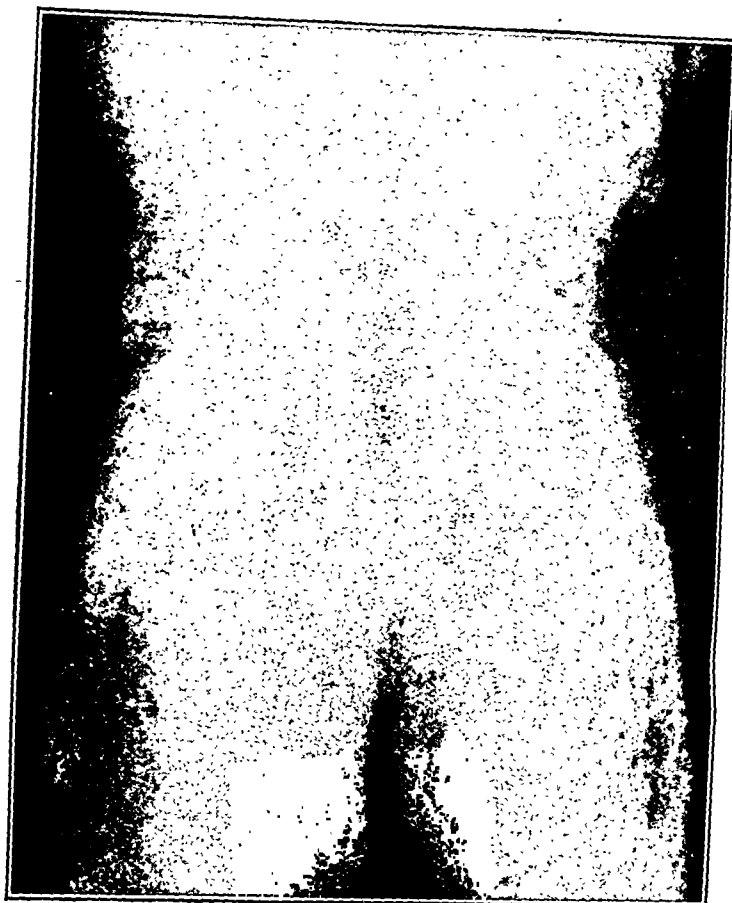


Fig. 2.—White spots occurring in dermatitis herpetiformis. Such lesions are found in pediculosis corporis, acne vulgaris, lepra, etc. They have nothing in common with the lesions of white-spot disease.

pages in order to give credit to the various authors, and properly to express and support our contentions. In the fifteen minutes at our disposal it is, of course, impossible to do more than to give the essential clinical and histologic details of the cases under our personal observation and to give the conclusions we arrived at after a careful study of the question. If at this time we do not seem to be fair to other investigators and if we do not appear to prove our contentions, we ask our colleagues to await the publication of the entire article before criticizing our findings.

Evidently, a judicious scheme of elimination would seem desirable in order to clarify the subject, at least so far as our present-day knowledge will permit. In order to avoid confusion it would appear to be a good plan to omit the polemic discussion of the cutaneous changes which obviously have but little if any bearing

* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

* From the Dermatological Department of the College of Physicians and Surgeons, Columbia University.

on the subject of white-spot disease or morphea guttata or circumscribed scleroderma, in any of their varied clinical and pathologic manifestations. Interesting as these remotely related disease-processes undoubtedly are, it can hardly be said that their inclusion in a discussion dealing with white-spot disease is in any way conducive to a clear understanding of an already involved subject.

We shall at once exclude all but three groups of cases. These three groups consist of the unclassified group, consisting mainly of the cases of Westberg, Johnston and Sherwell, Hazen and Riecke; the sclero-



Fig. 3.—Acanthosis over center of lesion (from microphotograph, first biopsy, low power). Under this is a triangular-shaped area of cellular infiltration with its apex at lower part of reticular layer. At base of triangle is a large area of degeneration. This area contains a crystalline deposit (artefact) which shows in the picture.

derma group and the lichen planus sclerosus group. Following the lead of Montgomery and Ormsby, Petges and others, we believe that lichen planus sclerosus, which is the same disease as lichen albus, while having clinical and pathologic features resembling, to a certain extent, localized scleroderma, can be clearly differentiated. We, therefore, exclude the lichen planus group. This leaves for consideration the four or five unidentified cases and the cases that have been clearly shown to belong to scleroderma.

We will state here that we believe the term "white-spot disease" should be retained, but limited to cases that can be grouped with scleroderma, accepting Unna's card-like scleroderma as the type.

In other words, our conception of scleroderma is a broad one and in a way may be likened to that of syphilis, in which there are a number of different cutaneous eruptions. In this way we would have white-spot disease represent a distinct type of scleroderma just as morphea is a distinct type of scleroderma.

CHARACTERISTICS OF THE DISEASE

The clinical findings in the reported cases have varied to a considerable degree, but we believe that this is merely an expression of the various stages of evolution. We present herewith a composite clinical picture of the affection.

White-spot disease occurs mostly in females, especially in those of a neurotic temperament. It may occur in childhood and in early and late adult life. Most of the reported cases were in the third and fourth decade. The disease is essentially chronic in its course, the lesions making their appearance insidiously and developing slowly. Aside from moderate pruritus at the beginning, subjective symptoms are rare. The sites of predilection are at the base of the

neck, in front and behind, the upper portion of the chest and back, but the lesions may appear on the extremities, various portions of the trunk, on the genitals, etc.

The essential lesion is a small white spot. The color may be snow white, ivory white, bluish-white, etc. The lesions may vary in size from a pin-head to a dime. They may be isolated, sparse and widely scattered, or they may be numerous, grouped and confluent. The surface may be smooth or wrinkled, glistening or dull, depressed or slightly elevated or level with the surrounding skin. There may be slight telangiectasia. The center of the lesion may appear depressed. There may be a violaceous areola. They may contain horny plugs and they may be scaly.

To the palpating finger the lesions may be imperceptible, or they may impart a sense of resistance.

It is far more difficult to give a composite picture of the histopathology because most of the cases differ, especially with regard to details. In the majority of instances there was a thickening of the horny layer. In a few cases there were dilated follicles filled with keratin. The granular layer and the rete were thinned, the basal layer irregular and the interpapillary prolongations lost. There were usually a number of spaces directly under the epidermis which were probably dilated lymph-vessels. This fact is rather interesting because Unna considers these spaces partly responsible for the white color.

The chief changes in the derma consist, in the early stages, of a more or less circumscribed area of perivascular round-cell infiltration, edema and other signs of inflammation. Later, there is a marked increase of connective tissue, the infiltrate, except at the periphery, disappears and the blood-vessels and lymph-spaces diminish in number and size. Elastic tissue is usually lost or greatly diminished. In other words the general picture is that of scleroderma.



Fig. 4.—Epidermis sinuous (from microphotograph, second biopsy six months later, low power). Loss of interpapillary prolongations. Disappearance of cellular infiltrations. Hypertrophy of collagen.

REPORT OF CASE

Before going any further we desire to place on record a case of white-spot disease that was observed in Dr. Fordyce's clinic.

Patient.—Man, aged 43. The eruption had existed for four months. The patient stated that he noticed the four lesions at the same time and that they had not changed in appearance since he first noticed them. We were unable to decide whether the lesions had developed slowly or suddenly. There were no subjective symptoms. Syphilis and tuberculosis were excluded.

Examination (November, 1913).—The patient is a tall, thin man of distinctly neurotic type. A general physical examination revealed nothing of interest. The entire cutaneous surface, including the visible mucous membranes, was normal, with the exception of the lesions about to be described. There was absolutely no sign of lichen planus. The eruption consisted of four lesions, two of which were on the dorsal

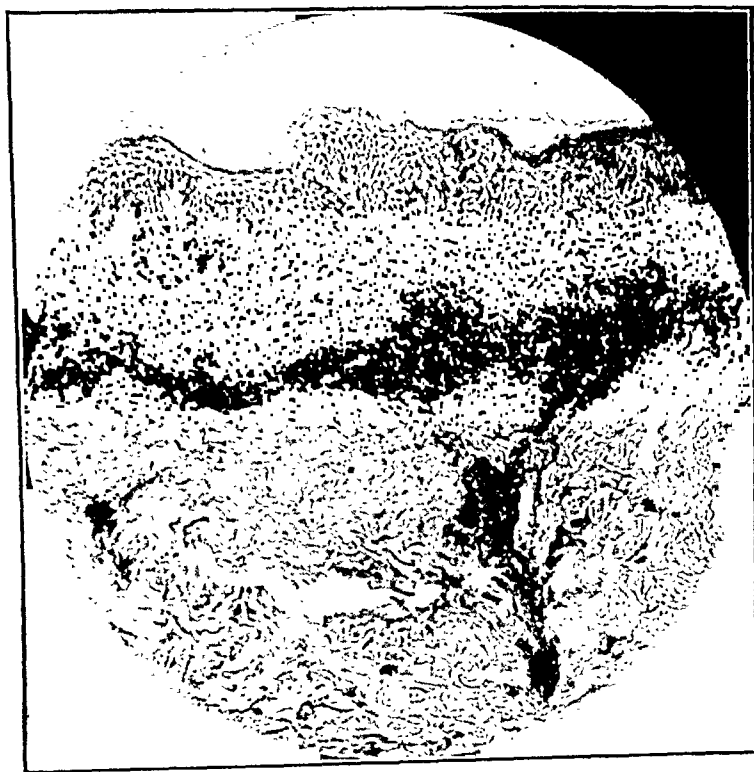


Fig. 5.—Tissue removed from a lesion which closely resembled white-spot disease. The histologic picture is that of lichen planus. Note the extensive subepidermal vacuolization.

surface of the penis and two on the anterior surface of the scrotum. They were all about the same size, roughly speaking, about 0.5 mm. in diameter. The lower penile lesion was a little larger than the others. There was a marked disk-like configuration, with a well-defined, slightly irregular or crenated border. The penile lesions appeared as though they were embedded in the skin, like mosaic; this appearance was less marked in the scrotal lesions. Palpation revealed slightly perceptible infiltration, but there was no distinct sense of resistance. The margin was, perhaps, very slightly elevated, while the center was apparently depressed and from a clinical point of view seemed to be slightly atrophic. The color was the most striking feature. The border of each lesion was an opaque, glistening white, resembling porcelain. The center was semitranslucent and bluish white, resembling mother-of-pearl. The upper penile lesion was surrounded by a slight violaceous band. The surface of the lesions was smooth.

The patient was not seen again until the latter part of May, 1914, after an interval of six months. There was no change in the clinical appearance of the lesions.

Histopathology.—Both of the penile lesions were excised in their entirety for the purpose of histopathologic study. The upper lesion was removed in November, 1913, and the lower one in May, 1914.

First Biopsy: The central part of the lesion shows a general hypertrophy of the epidermis with a central depression or dell. The interpapillary pegs have united to form a broad plate. The horny and granular layers are thicker here than in any other portion of the section. The rete is also increased in thickness; the cells stain poorly and the prickles are indistinct; a number of the cells have lost their nuclei. The basal layer is irregular, vacuolated and is not sharply differentiated from the underlying cutis.

Derma: In the center of the lesion the derma is occupied by a somewhat triangular-shaped area of small round-cell infiltration with the base of the triangle close to the epidermis,

and its apex situated in the lowermost portion of the reticular layer. This infiltration consists for the most part of lymphocytes, with plasma-cells and fibroblasts scattered throughout the area. Where the infiltration is most dense, collagen is practically absent. There has been an increase in the number of capillaries but most of the vessels have been occluded by endothelial proliferation and by the compression exerted by the cellular infiltration. Just under the epidermis and extending the full width of the diseased area, is a zone of colliquative degeneration or necrosis. Here the tissue elements are no longer discernible. In a few sections a large subepidermic cavity was noted in the degenerated area. This was occupied by a homogeneous mass containing a few cells and reminded us of a similar condition found in Johnston and Sherwell's case.

At the margin of the lesion the interpapillary pegs are flattened out. The papillary layer shows a condensation with subepidermic spaces. Here there are a few scattered lymphocytes, plasma-cells and chromatophores. In the reticular layer the collagenous bundles are composed of very coarse fibers, separated here and there by edema. There are a few circumscribed areas of round-cell infiltration closely limited to degenerated and occluded vessels. The only appendages noted were a few coil-glands which appeared to be dilated and were surrounded by a moderate round-cell infiltration.

Second Biopsy: The epidermic changes consist of an entire flattening out of the interpapillary pegs. The horny and granular layers and the rete appear normal.

Derma: There is a distinct fibrosis, hyperplasia, in the upper two-thirds of the cutis. The tissue is dense and stains deeply with eosin. Here we find large, coarse, wavy fibers. In the upper corium the blood-vessels are reduced in number and size; the endothelium is prominent. There are a few areas of moderate perivascular round-cell infiltration. In the rest of the corium the only cells found are fibroblasts. In the lower third of the cutis the collagenous tissue consists of a fine network of delicate fibers producing the appearance of areolar tissue. Elastic tissue is present directly

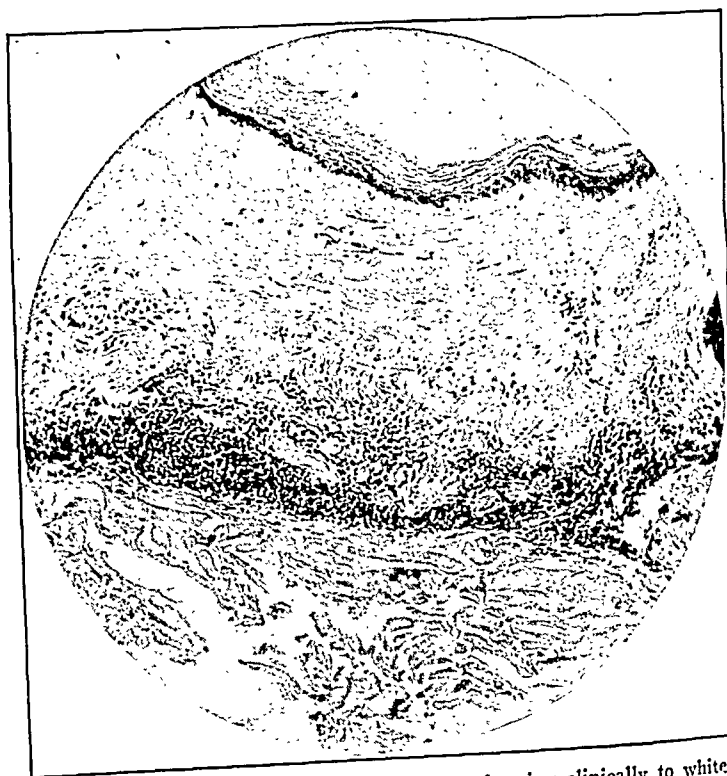


Fig. 6.—Tissue removed from a lesion conforming clinically to white-spot disease. The atrophy of the epidermis, loss of rete pegs, sclerosis of papillary layer and upper reticular layer together with underlying zone of infiltration, points to lichen planus sclerosus. Illustration taken from Fordyce's article on lichen planus (*Jour. Cutan. Dis.*).

under the epidermis. Then there is a narrow zone extending through the lesion where the elastic tissue is either absent or badly fragmented. Lower down it again appears and, with the exception of some fragmentation, is practically normal.

Summary.—The disease apparently began as an inflammation with a perivascular infiltration of small round cells. These areas then united to form a diffuse infiltration in the center of the lesion. The inflammation was apparently intense enough to produce degenerative changes in the upper part of the corium. The epidermic changes were probably secondary.

Sections made from tissue obtained six months later show a disappearance of the inflammation with hypertrophy of collagen, loss of vessels, elastic tissue and rete pegs.

We also studied three cases of lichen planus sclerosus, representing three different stages of evolution, but these cases will not be reported here.

It will be recalled that we accept, as examples of white-spot disease, twenty cases that have been definitely identified as scleroderma and that we excluded lichen planus sclerosus and many other conditions.

This leaves for discussion the unclassified cases reported by Westberg, Johnston and Sherwell, Hazen

combines the unclassified cases of white-spot disease with the cases falling under the general heading of scleroderma.

CONCLUSIONS

White-spot disease is a special form or type of scleroderma which can be differentiated, both clinically and histologically, from other affections with white lesions.

Lichen planus sclerosus and atrophicus or lichen albus, although giving rise to white lesions, has nothing in common with white-spot disease.

The unclassified cases of white-spot disease, such as those of Westberg, Johnston and Sherwell and Hazen, belong to the scleroderma group and, therefore, are true examples of white-spot disease.

The discrepancies in histologic and clinical findings are due to the fact that the studies were made at different times with respect to the evolution of the disease.

We desire to thank Dr. John A. Fordyce for his kindness in placing at our disposal the material that forms the basis of this study. We wish to express our gratitude to the staff of the Dermatological Laboratory for the careful technical work. We especially desire to thank Dr. Elizabeth C. Jagle for her aid in the study and interpretation of difficult material.

ABSTRACT OF DISCUSSION

DR. H. H. HAZEN, Washington, D. C.: Drs. MacKee and Wise were most fortunate in being able to perform biopsies at such varying intervals, and to demonstrate that a process originally showing rarefaction of the corium may eventually terminate in morphea. It would seem that they have solved the question of the various unclassified cases, my own among the number, of white-spot disease, and that these cases are true scleroderma. While I have lost sight of my patient I know where she is living and shall try to obtain more tissue from her in the hopes of confirming the observations of Drs. MacKee and Wise.

DR. F. W. CREGOR, Indianapolis: I direct attention to the similarity between the histopathologic picture presented by Dr. MacKee in this case and that given by Dr. M. B. Hartzell in connection with his paper on granuloma annulare. I previously made the statement that I had not heretofore considered granuloma annulare an entity, and now, in comparing these two histopathologic pictures, I must confess that if each were an entity I would have great difficulty in differentiating one from the other microscopically.

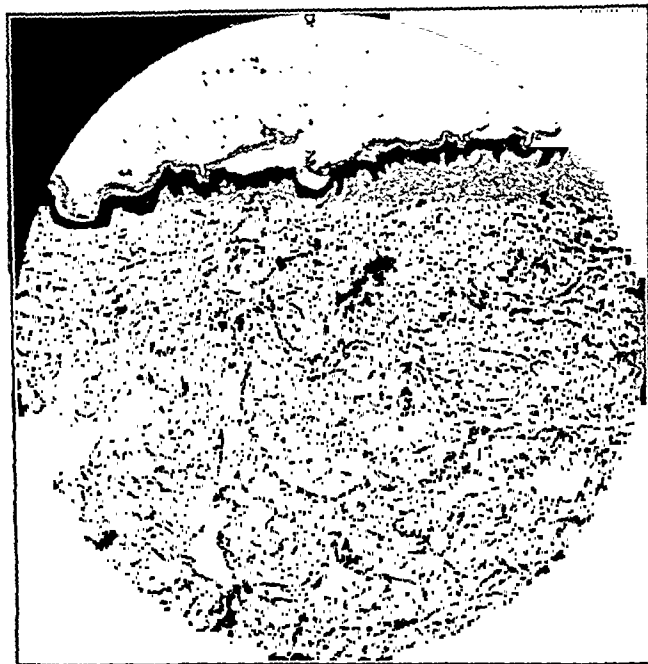


Fig. 7.—Tissue removed from a lesion in a case of lichen planus presenting lesions simulating white-spot disease. Atrophy of epidermis. Rete pegs almost obliterated. Sclerosis of papillary layer. Hypertrophy of collagen of reticular layer. Blood-vessels markedly reduced in number. No infiltration.

and Riecke. Unfortunately, time will not allow of a discussion of the details of these cases so that we can only give our conclusions concerning them. Our early lesion showed the loss of collagen reported by Johnston and Sherwell and by Hazen. Montgomery and Ormsby and Unna also noted loss of collagen in early lesions. Our late lesion depicted the hypertrophy of collagen and other changes observed by most investigators. If we had been compelled to rely entirely on the histologic findings in our early lesion our case would have been classed in the group containing Johnston and Sherwell's and Hazen's cases. On the other hand, if we had only the later lesion to study, the case would have been added to the scleroderma group. We assume, therefore, that if these investigators had been able to study their cases at different stages of evolution, an entirely different conclusion would have been reached. We believe that our case

RADIUM

ITS USE AND LIMITATIONS IN SKIN-DISEASES *

FRANK E. SIMPSON, M.D.

CHICAGO

The scope of this paper is limited to the use of radium in dermatology.

In radium therapy everything depends on the proper equipment and the technic.

For dermatologic cases I have used varnish applicators of different types.

A useful style of apparatus is the so-called "toile" or flexible linen applicator. One apparatus of this type is rectangular in shape, covers 12 sq. cm. of surface and is of one-twentieth strength.

Other applicators have metal instead of linen backs, are square or round and are of one-fourth, one-half or full strength. As the applicators are constructed so

* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

that 10 mg. of the radium salt are spread over 1 sq. cm. of surface, a one-twentieth-strength applicator contains about 0.5 mg.; a one-fourth-strength, 2.5 mg.;

nomenclature that will express the amount of radium element instead of radium salt in each square centimeter of the applicator, a terminology that has much in its favor.

The chief advantage of the varnish applicators over other styles of apparatus lies in the uniformity of their



Fig. 1.—Epithelioma of left temple; photograph taken May, 1913.

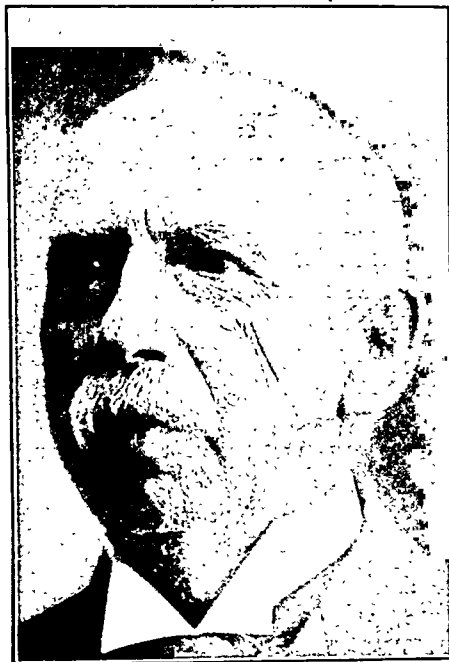


Fig. 2.—Patient in Figure 1, after eight hours' treatment with $\frac{1}{4}$ -strength radium applicator screened with 0.1 mm. silver; photograph taken July, 1913; no recurrence to present time.

action over their entire surface. Certain types of radium applicators produce a more intense reaction at the point of application than at the periphery of a lesion, which is an obvious disadvantage.

The technic of radium treatment is extremely varied



Fig. 3.—Epithelioma of right side of face; photograph taken July, 1913.



Fig. 4.—Patient in Figure 3, after ten hours' treatment with $\frac{1}{4}$ -strength radium applicator screened with 0.1 mm. silver; photograph taken October, 1913; no recurrence to present time.

and can be learned only by a certain amount of experience with each applicator.

In general, one uses the apparatus either naked, that is, wrapped only in rubber tissue, or with screens of metal interposed between the applicator and the

a one-half-strength, 5 mg., and a full strength, 10 mg. of radium sulphate to each square centimeter of applied surface. Many authors prefer the use of a

skin. Lead, silver, aluminum, brass and platinum have been largely used as screens, but a tendency is now noted toward the discontinuance of lead screens on account of the irritating secondary rays developed when the radium rays pass through lead. I have commonly used screens of aluminum or silver which are

too far advanced to be materially benefited. It would be premature to try to draw conclusions at present as to the relative efficiency of radium and the Roentgen ray in epithelioma. Both agents, I believe, have distinct fields of usefulness in this disease.

Epithelioma may be healed with radium, applied



Fig. 5.—Lupus erythematosus of nine years' duration, symmetrically involving nose and both cheeks; photograph taken February, 1913.



Fig. 6.—Patient in Figure 5 after treatment with $\frac{1}{4}$ - and $\frac{1}{2}$ -strength radium applicators unscreened; photograph taken April, 1914.

covered with from five to ten thicknesses of black paper to absorb the secondary rays, the whole apparatus being then enveloped in rubber tissue and applied to the skin by adhesive or rubber bands.

Radium reactions in the skin have sometimes been compared too closely with Roentgen-ray reactions. In general, radium reactions are much more benign than Roentgen-ray reactions, and when destructive inflammation has been produced, healing is much less slow and uncertain. This is especially true of the reactions in which beta-rays predominate, but even severe gamma-ray reactions are more benign than severe Roentgen-ray reactions.

In order to limit my remarks, only three groups of diseases will be touched on at this time: epithelioma, lupus erythematosus and angioma.

EPITHELIOMA

It has been sufficiently demonstrated that radium is a very efficient agent in epithelioma of the skin. Up to the present time I have treated about forty cases. To a certain extent these were selected cases, being of the type usually treated by the dermatologist. In two of these cases success was only partial; but healing, I believe, might have been brought about had I been able to continue the treatment. The general experience, however, leads to the belief that certain epitheliomas are probably resistant to radium as well as to other forms of actinotherapy, while other cases are

without or with a screen. Without a screen, an epithelioma 2 or 3 cm. in diameter and not too deeply situated may be healed with a one-fourth-strength applicator in five or six treatments of an hour each. With a screen of 0.1 mm. of silver, eight hours may be required. Recently I have made more frequent use of screens in order to limit the inflammatory



Fig. 7.—Lupus erythematosus of eight years' duration involving right cheek and upper lip; photograph taken February, 1913.

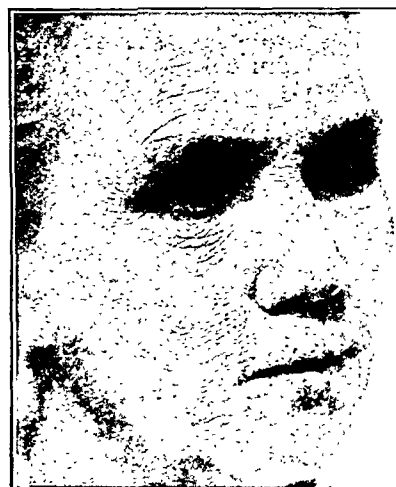


Fig. 8.—Patient in Figure 7 after treatment with $\frac{1}{4}$ - and $\frac{1}{2}$ -strength radium applicator unscreened; photograph taken July, 1914.

reaction and because experience has shown that the deeper parts of the growth are probably better reached. An epithelioma can also be healed with a single massive dose of heavily screened radium, but I have hitherto preferred to use fractional doses. The method

of operation is determined solely by the nature of the growth and the convenience of administering the treatments. The cosmetic results are equal if not superior to those obtained by any other method.

relieved symptomatically. Under radium treatment a few inoperable cancers in various situations have been made operable and a few have apparently recovered.

LUPUS ERYTHEMATOSUS

About twenty cases have been treated. In view of the intractable nature of this disease, the results of radium treatment are on the whole very encouraging. In selected cases I have been able to obtain complete involution of the disease. Unfortunately, relapses may occur; but these so far have yielded to persistent treatment. The painless character of the applications enables one to pursue the treatment vigorously. The technic has much to do with success or failure. The chronic "fixed" types are best treated with destructive doses. Experience with this disease has led me recently to prefer screened radium. I now use in the



Fig. 9.—Cavernous vascular nevus of upper lip; photograph taken April, 1914.



Fig. 10.—Patient in Figure 9 after treatment by "cross-firing" with $\frac{1}{4}$ - and $\frac{1}{2}$ -strength radium applicators screened with 0.1 and 0.5 mm. silver; ten exposures of fifteen minutes each; nevus was removed without visible inflammatory reaction; treatment not quite completed; photograph taken May, 1914.

While the treatment of internal cancer with radium is not germane to the present discussion, a few remarks may be made on this important topic. In general the present attitude of most workers with radium in cancer of the deeper structures is one of strict conservatism. Few writers go so far as Bumm,¹ who believes that in the future cancer will be treated by radiotherapy. Most authors agree with Wickham and Degrais,² who in a recent article take the position that radium is to be regarded strictly as an adjunct to surgery.

The general opinion seems to be that operable cancers should be operated on. Radium may be of great value prior or subsequent to operation. Inoperable cancers may be treated with radium to minimize suffering and perhaps prolong life. Inoperable cancer in some situations, as in the cervix uteri, may be wonderfully



Fig. 11.—Vascular purplish-red nevus, irregularly elevated and deeply infiltrated; photograph taken September, 1913.



Fig. 12.—Patient in Figure 11 after treatment with $\frac{1}{4}$ - and $\frac{1}{2}$ -strength radium applicators unscreened; nevus was removed with three series of exposures of about four hours each; the small patch at corner of mouth has not been treated; photographed May, 1914.

average case a one-fourth- or one-half-strength applicator screened with 0.1 mm. of silver, and treat each patch from about four to six hours in the course of two weeks. The inflammatory reaction is thus ren-

1. Bumm, E.: Further Results with Radium Therapy in Carcinoma, Berl. klin. Wehnschr., 1914, li, 193.
2. Wickham and Degrais: Can Radium Be of Value to Surgery in the Treatment of Malignant Tumors? Fortschr. a. d. Geb. d. Roentgenstrahl., 1913, xxi, 333.

dered less severe than when naked radium is used. Unfortunately, some patients, when they first come under observation, are more or less scarred by the disease or by previous treatment. Even in these cases the cosmetic result is sometimes quite satisfactory. In selected cases of not too long duration or of too large area a very good cosmetic result has been obtained.

ANGIOMA

The results obtained in certain types of nevus vascularis (birth-marks) are superior to those hitherto obtained by any other method. In a certain number of angiomas radium offers the only practical method of treatment. It is particularly successful in the angiomas of children on account of its painlessness.

Large flat angiomas (port wine stains) of deep red color can often be treated with a good cosmetic result. While amenable to several different technics, "port wine stains" are most successfully treated by giving just enough raying to produce a marked erythema with desquamation. With a one-twentieth-strength applicator screened with 0.01 mm. of aluminum the proper amount of reaction can be produced in about four or five hours. Several repetitions of this treatment will often result in a satisfactory decolorization.

Elevated, papillomatous angiomas must be treated with slightly stronger doses in order to level the surface and bring about decolorization. With a one-fourth-strength applicator, unscreened, an exposure of from two to four hours may be given in fractional doses. When the reaction subsides, the series of treatments may be repeated if necessary. Several courses of such treatment will usually bring about the desired result.

With certain types of cavernous angiomas in children, a reduction and leveling of the tumor can sometimes be produced without visible inflammatory reaction. This shows the specific and selective action of radium on the blood-vessels. In these cases I have used either a one-half- or one-fourth-strength applicator screened with 0.1 mm. of silver, and have given exposures of fifteen or twenty minutes' duration.

To attain the best results in angiomas, infinite care and attention to detail are needed. While the cosmetic results are naturally not always absolutely perfect, the enormous improvement is so noteworthy as to be nearly always satisfactory to patients. In selected cases an almost perfect cosmetic result can be obtained.

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THE RELATIVE VALUE OF RADIUM IN DERMATOLOGY*

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On account of the extravagant exploitations of radium by the profession as well as by laymen, a statement as to its actual value as a therapeutic agent (at present) may be enlightening. The majority of physicians are not in a position to judge the merits of this element, because its scarcity and high price place it beyond their reach. Judging from the unusual publicity accorded the discovery of this new chemical, with its marvelous physical properties, it was logical to

expect that the therapeutic results would be quite phenomenal; but such results take years to perfect. The premature, hothouse exploitation of radium, hybridized by a cross between its unusual phenomena and the publicity given them, have resulted in disappointment, which was to be expected. After the initial period of exploitation, every new therapeutic agent goes through an evolutionary period in the hands of those who are scientifically inquisitive, and eventually its true value is established. For instance, the Roentgen rays, which were discovered seven years before the discovery of radium, are now just beginning to be employed scientifically, and it will be some years hence before the prejudice and skepticism resulting from premature, unscientific and extravagant exploitation of the Roentgen rays can be dispelled. In the same way the preposterous claims of radium fanatics provoke one to an underestimation of its value.

For two purposes one must acknowledge that radium has greater possibilities than any other similar agent in use at present, namely, (1) in diseases of faulty metabolism, in which the radium emanatorium may be used, and (2) in malignant lesions of cavities, in which the neoplasm is inaccessible or difficult to expose to direct application of Roentgen rays, such as the esophagus, rectum, vagina, urinary bladder, fauces, etc.

The application of radium to benign growths is unnecessary in my opinion, because benign conditions can be controlled more quickly and easily and with less expense by the electric desiccation method of Clark, and by massive doses of Roentgen rays.

One fact that would seem to justify hopes of superior results from radium is that the most penetrating Roentgen rays in use represent the output of a 60,000 to 100,000 volt current, while it is estimated that an electric current of from 600,000 to 1,000,000 volts would be necessary in order to produce Roentgen rays of as great penetration as the most penetrating rays of radium, that is, currents ten times greater than the strongest currents now employed for the Roentgen rays. Previous to the advent of improved Roentgen-ray tubes of the Coolidge type this argument was more convincing than at present; with the penetration of the Roentgen rays completely under one's control, it is reasonable to hope that Roentgen rays can soon be generated, having nearly as high a penetration as the gamma rays of radium, and it is certain that Roentgen rays can be produced from electrical sources in greater quantity and at less expense than the gamma rays of radium can be obtained.

The field of usefulness of radium has been greatly increased since the employment of radium emanations. The bulk of radium is so small that formerly it could be applied only to limited areas. The present method is to draw off the emanations of radium into glass capillary tubes, which retain for about twenty-four hours a radio-activity approximately equal to that of the original radium. A lesion of any size can be covered by these glass tubes, arranged parallel to each other. By the addition of fresh emanation each day to these mats of parallel tubes the radio-activity can be continued indefinitely. In the field of local applications to lesions of the skin and mucous membrane the agents to be compared with radium are electrical desiccation (Clark), ultraviolet rays (as applicable from a Kromayer lamp), massive doses of Roentgen rays of controllable penetration (Coolidge), surgery and destruction by caustics, cautery or cold. In com-

* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

paring the relative value of these methods eight points should be considered.

1. Cost: Radium is far more expensive than any of the other methods. Massive Roentgen rays, electric desiccation and ultraviolet rays come next in expense. Surgery and caustics are the cheapest.

2. Ease of Application: As to ease of application, much depends on the training of the person who administers the treatment. Each therapist will naturally do the best work with the greatest ease by employing that agent with which he is most familiar. Other things being equal, radium and caustics are easier to apply than the other agents in question.

3. Time Consumed in Treatment: Radium applications are much longer in duration than any of the other methods. They require hours while the other treatments require minutes.

4. Pain: Radium, Roentgen-ray and ultraviolet light treatments in proper dosage cause no pain. Electric desiccation and carbon dioxid snow cause slight pain. Surgery and cauterization are very painful and require a local anesthetic. Chemical caustics are the most painful.

5. Cosmetic Effects: Cosmetic effects are best after radium, Roentgen rays, ultraviolet light, desiccation and carbon dioxid snow, and poorest after surgery or cautery.

6. Dangers: With a proper technic there are no dangers in any of these methods. Poor technic is a *de facto* contraindication for the use of any agent.

7. Superficial Healing and Deep Extension: The well-demonstrated superficial healing powers of radium and the Roentgen rays should not mislead one into attempting to cure too extensive a lesion with these agents alone, lest the lesion make deep inroads while valuable time is wasted on superficial healing.

8. Indications in Dermatology: Non-malignant and skin conditions, such as warts, moles, nevi, acquired blemishes like tattoo marks or keloids, lupus, ureteral caruncles, mycosis fungoides, blastomycosis and acnes can most readily be controlled by electric desiccation (Clark). If one has the equipment, massive doses of Roentgen rays, carbon dioxid snow and ultraviolet rays may be used in these conditions with advantage. Radium will give good results, provided the radium and time necessary are available. For superficial lesions surgery is contra-indicated, because better cosmetic results can be obtained with less danger and less pain by non-surgical methods. Psoriasis, eczemas and skin-diseases due to faulty metabolism should be treated first by systemic measures, including radium emanation, if available. When this does not produce the desired results, electrical methods such as massive Roentgen rays are indicated. In deeper malignant conditions of the skin, the following therapeutic program should be adopted:

1. Massive Roentgen deep therapy or massive radium deep therapy.

2. Complete radical operation, preferably by bloodless methods such as thermopenetration, electrocautery, or massive caustics (Stroebe).

3. Effulguration (de Keating-Hart) into the wound.

4. Postoperative Roentgen deep therapy or massive radium deep therapy.

In hopeless malignant skin conditions the patient's symptoms can frequently be much ameliorated by massive deep roentgenotherapy or radiotherapy.

103 Park Avenue.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. SIMPSON AND HOLDING

DR. WILLIAM DUANE, Boston: Radium is continually producing radio-active gas, and when the gas comes in contact with any material substance, that substance in turn becomes radio-active. In a small glass tube, containing the gas, I placed a thin sheet of steel and it also has become radio-active, as can be easily demonstrated by breaking the tube, removing the steel and holding it near a phosphorescent salt. Some years ago I suggested that sheets of metal or other substances, made radio-active in this way, should be used instead of the radium itself in the treatment of cancers. This method has certain advantages over the use of radium itself. It is very flexible. The applicators may be of any size and shape desired, and may have any strength. They will lose their activity after a certain time, and are then of no further value until again exposed to the radium emanations. A number of cases have been treated by the staff of the Harvard Cancer Commission at the Huntington Hospital by this method of deposited activity. The most complete removals of malignant tumors we have observed so far, were treated in this way. Dr. Simpson is correct in his statement concerning the differences between the Roentgen rays and the radium rays. Physical scientists tell us that four kinds of rays come from radium, the alpha-, beta-, gamma- and delta-rays. It is known that the gamma-rays are similar but not exactly the same as the Roentgen rays. During the past two years much important work has been done on these rays, and we have learned that Roentgen rays are very short waves of ultraviolet light. Gamma-rays are still shorter. The alpha- and beta-rays are of a totally different nature. They are corpuscular and not regular waves. We also get two kinds of rays from the Roentgen-ray tube; one depends on the tension of the tube and the other on the antikathode. In answer to Dr. Dyer as to how long a piece of metal will remain active after being exposed to these radium emanations, the activity will last on an average of a little over an hour, gradually dropping to zero. The dosage can be accurately measured, as it always follows the same law. A tube of this kind filled with radium emanation will lose one-half its strength in four days; in four more days it will again be one-half weaker, and so on, losing one-half its strength every four days.

DR. ISADORE DYER, New Orleans: What method does Dr. Duane employ in obtaining these radium emanations? Is it necessary to use a glass tube? How long does the steel or other substance used remain radio-active?

DR. HENRY C. BAUM, Syracuse: How long can the metal remain in the unopened tube before losing its activity?

DR. FRED WISE, New York: What factors are necessary to produce a lesser or a stronger activity?

DR. JAY F. SCHAMBERG, Philadelphia: I have had some experience with radium during the past seven years, but have not had a sufficient quantity to produce the effects that Dr. Simpson has achieved, and with the amount at my disposal I have not grown wildly enthusiastic concerning its effects on cancers of the skin, in which I have seen equally good results obtained with the Roentgen ray. Radium has one distinct advantage over the Roentgen ray—the constancy of the dosage. With radium one knows the exact amount of energy that is given forth; we secure a constant effect from a certain quantity in a certain time from a certain distance. Despite the various energy-measuring devices that have been used to secure precision of dosage of the Roentgen ray, there is still latitude for error. Radium also has the advantage of simplicity of application and of applicability to certain cavities of the body which are inaccessible to the Roentgen rays. Another advantage is the kindliness with which radium burns heal. I had an experience with this on my own skin, on which an experimental radium burn, although deep enough to produce necrosis, healed promptly without pain, leaving only a slightly depressed scar. A Roentgen-ray burn of the same depth would have caused more trouble.

DR. WILLIAM A. PUSEY, Chicago: I have used radium in a glass capsule for many years, and in an applicator for the past year or two, and in spite of all the care and judgment I could exercise, I have been unable to distinguish any difference whatsoever between radium and Roentgen-ray reactions. The radium burns with which I am familiar are produced by an abundance of the beta-rays as well as the gamma-rays, and they are identical with the burns produced by the soft Roentgen-ray tube. They produce the same kind of vesication with a necrotic pellicle, and, contrary to Dr. Schamberg's experience, heal with the same relative benignness. I see no difference whatever in clinical effects, between radium and the Roentgen ray. My standard of radium work has been Wickham's book—confined largely, I must confess, to a study of the pictures—and I can duplicate from my work with the Roentgen ray any of the results of the radium treatment shown in Wickham's book, including his results in the treatment of vascular nevi. The results of the radium and the Roentgen rays are due to the effect of actinic energy on the skin, and the actinic properties of both are identical as far as we can judge by all physical criteria. We are at present going through such a brain storm about radium as we went through with the Roentgen ray about ten years ago. We have gone into ecstasies about radium in cancer but the fact should be clearly fixed in our minds that in radium we are using a form of radiant energy similar to what we have been using for the past ten or fifteen years in malignant and pseudo-malignant growths throughout the body. We are destroying these cells wherever they are accessible but not where they are not accessible, and therefore we are not curing with radium lesions that are beyond the reach of radiant energy. We have not cured malignant growths in the cavities of the body with Roentgen rays; it is not now being done with the new "deep methods" with Roentgen rays or with radium, and the claims which are being made now for radium—as well as for the German "tiefen therapie" with Roentgen rays, are, in view of what we already know, unscientific and unreliable.

DR. GEORGE M. MACKEE, New York: I regard the action of radium and the Roentgen ray as practically identical, and I doubt if there is any lesion, not excepting nevi, that can be affected by radium that cannot be equally well treated with the Roentgen ray. While radium can be more easily applied to lesions in cavities, especially the mouth, yet, unfortunately, here the new growths are so malignant that I doubt whether radium is of much value in their treatment, except occasionally. I was much surprised to hear Dr. Schamberg say that the dosage of radium could be so much more readily gauged than that of the Roentgen ray. My view is exactly the opposite. The dose of the Roentgen ray can be gauged with almost absolute accuracy, as for instance in ringworm of the scalp, for which accurate dosage is absolutely essential. One disadvantage of the radium application, as compared to that of the Roentgen ray, is that the former must sometimes be continued for from four to twelve hours to get exactly the same result that could be obtained by one application of the Roentgen ray lasting from one to fifteen minutes. Dr. Duane's point concerning the deposited activity of radium was interesting. We have an analogous form of treatment with different kinds of metals that have been acted on by the Roentgen rays. The difference is that, heretofore, low vacuum tubes have been used, which gave out a different form of radiant energy from that of the gamma-rays. As to radiodermatitis produced by the filtered or the unfiltered rays, there is no difference between them except in degree, depending on the dosage.

DR. RICHARD L. SUTTON, Kansas City, Mo.: I disagree with Dr. Schamberg concerning the character of radium burns. Recently I had under my care a case of cancer *en cuirasse* which had been treated with radium. While the patient was little if at all benefited she was severely burned at a dozen or more points where the agent had been applied. The lesions healed slowly, and were very painful. Despite treatment, several of the burns were still present when the patient died, four months after her return from the sanatorium.

DR. FRANK E. SIMPSON, Chicago: I believe there is no question among physicists that the Roentgen rays and radium rays have certain differences: that the latter contain certain rays that have no analogue in the Roentgen rays. I do not agree at all with Drs. Pusey and MacKee that they both produce the same reaction or result on the skin. The fact that they are all forms of radiant energy does not imply that they are identical. I think there are certain things that can be done with radium that cannot be or at least have not been duplicated with the Roentgen ray. I have seen many cases of angioma successfully treated with radium that could not be duplicated with the Roentgen ray. As to lupus erythematosus, especially in lesions about the nose or eyes, I do not think such patients can be well treated with the Roentgen rays, lest we set up a severe reaction, while with radium I do not hesitate. In this disease radium is really worth while. Certain types of epithelioma I believe can be treated just as well with the Roentgen ray as with radium but there are other cases that do not yield to Roentgen rays. One of my friends, one of the best roentgenologists in Chicago, brought me a case which had absolutely failed to yield to the Roentgen rays, and it yielded very promptly to radium. This is a common experience with others who have used both agents. This may be partially a matter of technic. The form of induced radio-activity described by Dr. Duane, I think would prove very valuable in certain types of epithelioma, but it would be of less value in other dermatologic conditions, such as angioma, the treatment of which requires a certain amount of skilful cosmetic work.

RADIUM AND THE ROENTGEN RAYS IN RADIOTHERAPY

THEIR USES AND LIMITATIONS *

WILLIAM S. NEWCOMET, M.D.

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Rays generated from a Crookes tube may be considered as being identical with those eliminated from radium, varying somewhat, however, in regard to force; therefore before consideration of their therapeutic value, a comparison between them in regard to a few of the more important points dependent on their physical nature might be of interest, it being assumed that the general properties of these elements and the ordinary Roentgen apparatus are too well known to be rehearsed in this article.

The cathode- and the beta-ray seem to be analogous; the two have the same properties except in regard to speed. While the cathode-ray travels 5,000 miles a second, either from or impinging on the surface of the anode, causing the formation of Roentgen rays, the beta-ray is disrupted or exploded from the atom of one of these radio-active salts and leaves it at a rate of from 45,000 to 100,000 miles a second, generating during this disturbance the gamma-ray.

It is obvious that when we have a force of 5,000 miles a second on one side with another of from 45,000 to 100,000 on the other, the result must necessarily differ. A comparison of this with a large number of bullets being projected from or impinging on a surface, in one instance the force being from nine to twenty times greater than the other, gives us an analogy. It follows, as might be expected, that the gamma-ray has far greater penetrating powers than any Roentgen ray so far known, and while it may be possible to build a Roentgen tube that will give the required speed

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

to the cathode particle, as yet, with our present knowledge of physics, it has not been produced and there is no likelihood of its being accomplished.

Physiologically, the difference between low and high radiation is of the greatest importance; while the low rays are always most active, they lack penetration, and it is well known that the so-called burn is likely to follow their indiscriminate use. Therefore, on account of their activity and lack of penetration they are not so desirable as the higher rays, which possess penetration and are by no means so active in producing tissue change. This point may seem somewhat contradictory, but on analysis it will be found that experience and theory support each other. Let it be taken for granted that as these active low rays pass through tissue, a cell, here and there, feels the full force of the radiation while others are protected. This gives rise to a process in which may be found conditions varying from stimulation on the one hand to necrosis on the other; whereas, under the influence of

ried a fairly large proportion of high beta-rays, which, although thought to be useless, have from an experimental point of view a pronounced physiologic significance, and it may be possible that as these gamma-rays are projected through the tissues, the formation of secondary beta-rays may cause the more active change in tissues so commonly seen in reactions from radium.

This may, however, be due to another condition, which is possibly secondary but plays a distinct rôle in the issue between Roentgen and natural radiation; when the former is employed, the point of origin of the rays is usually from 10 to 20 inches from the body, and in this bundle of rays is a wide variation of one variety, a high tube containing a predominance of high rays, while in a low tube the opposite condition prevails. This, however, suffers modification between limits.

From radium spring three distinct forms of radiation: the first may be discarded, as it lacks penetration and would prove useful only when the naked salt was employed; unfortunately, by its exclusion, about 90 per cent. of energy is lost. The gamma radiation, which is supposed to be the important form, from a medical point of view, equals only about 1 per cent. There is not, however, the least doubt that when the medium beta-rays are employed it is possible to obtain about 7 per cent. efficiency of the whole mass, although it is on this point that there exists the greatest conflict of opinion concerning the two forms of radiation. The difference between radium, thorium and actinium in regard to the proportion of the different rays depends largely on the elements that go to make up the individual group; but it must be conceded that the gamma-ray of thorium possesses greater penetration than that of the other two groups. Necessarily this is also true of the beta- and alpha-ray. While some authorities assert that this is a distinct advantage, sufficient proof has not been given for its adoption as absolute.

The mode of application of these radio-active elements differs from that of the Roentgen rays; for instance, the radio-active salt is usually applied to the affected part in close proximity to the disease; therefore, we have a given amount of high-penetrating rays springing from a point near to, and not at a distance, as is usual in Roentgen radiation. This point is of more material interest if several sittings are given, for should there be any tissue between the diseased portion and the radio-active salt, it is not likely to receive the activity at more than one sitting.

Therefore, from a physical point of view, the following differences are observed between Roentgen radiation and the radiation from these elements:

First, the rays differ in penetration.

Second, it is possible the high beta-rays also play a very active rôle, and consequently differ in quality.

Third, the relation of the radiation to the surface and the several planes of tissue is materially altered.

Another point which has been brought out in Bayet's publication is that the dosage of these radio-active elements can be measured with an exactness that is absolutely impossible in Roentgen radiation, and while this is true to a great extent, the variation in the amount of radiation from a Crookes tube is not of sufficient importance to cause it to be made an issue; furthermore, the idiosyncrasies that exist to both forms of radiation cause more anxiety and are more important than the slight variation in dosage.

From the physical difference which has just been cited as existing between these two forms of radiation

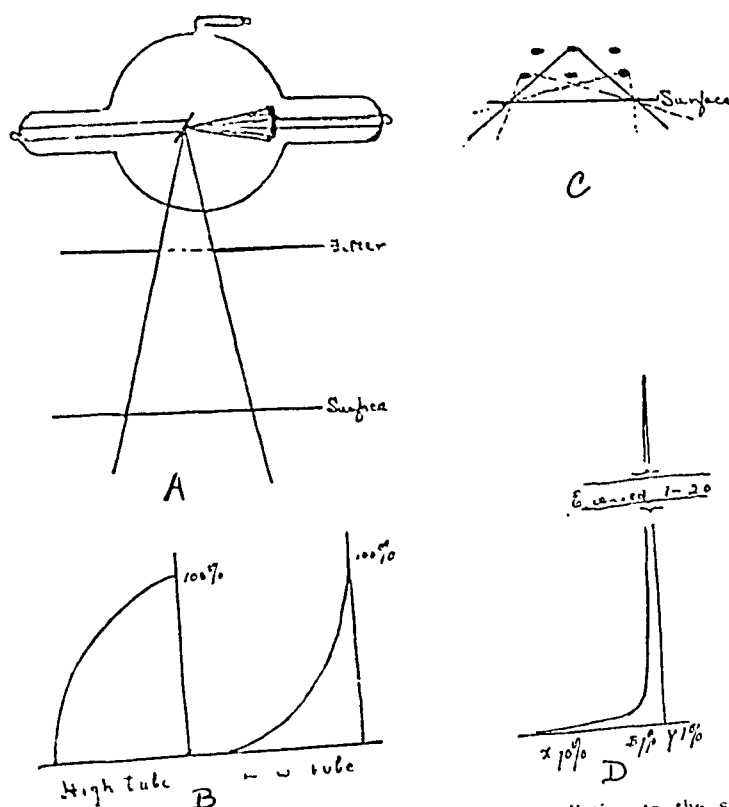


Fig. 1.—Diagram: A, showing the relation of radiation to the surface and the penetration of equal proportions; compare with C, filter surrounding the radio-active elements and a frequent change of base possible. B and D, comparative curves showing penetration of the different rays.

the high radiation, the effects are more uniform, each cell receiving an equal amount of radiation. If this be true macroscopically, then why not apply the same microscopically? For instance, the important part of the cell is its nucleus, and therefore, if the radiation is obstructed by the cell elements, the nucleus, being protected by them, naturally escapes; this causes an inflammatory reaction, but it is doubtful if it results in the death of the cell. On the other hand, if the radiation is high, all parts of the cell receive about the same amount of radiation and this causes an equal amount of degeneration in all parts and consequent death of the nucleus. Therefore, on this theory the high rays should prove most desirable as a therapeutic agent.

A second difference between the Roentgen radiation and that of these radio-active elements is that there is not the least doubt that with the gamma-ray is car-

tion, it would be expected that the effect on tissue would also be materially altered; and this view is further substantiated by observation. It might be said that the reaction produced by these radio-active salts is decidedly more intense, is usually confined to a limited area and is in turn followed by a fairly rapid restoration of the part; the same degree of reaction produced by the Roentgen ray would be more widespread, the damage to the tissue in the affected part

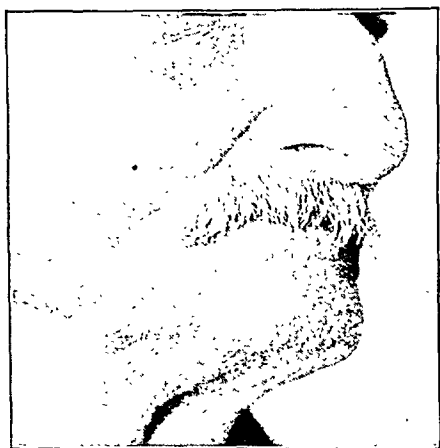


Fig. 2.—Epithelioma of the buccal surface of the mouth; extensive involvement, perforating the cheek at the site of the present dimple. Result obtained from 11 mg. specimen radium (records of the American Oncologic Hospital). (A similar case relieved by applications of 1 mg. Referred by Dr. J. B. Deaver.)

more uniform, and healing extremely slow. Even the reaction of a chronic character caused by these radio-active elements, as observed in the laboratory worker, will rapidly disappear if the process has not been allowed to progress too far, while the same amount of damage done by the Roentgen ray would produce results that would possibly last a lifetime.

It can be easily seen that under these conditions it is possible to use the radio-active elements and do less harm to surrounding structures than by the other form of radiation, and attention has been called to the fact that very few poor results have been seen from radium. This is thought by some authorities to be due to the care taken in making these applications; possibly this assertion may be correct, for the warning was given by its predecessor, and very few care to witness the burns which were contracted in the early days of the Roentgen ray. Too much credit, however, must not be given to those applying radium, for those differences of a physical nature which exist and seem to be material in this issue cannot be overlooked.

Curiously, however, the varying susceptibility to these radio-active elements seems to be in greater proportion than to the Roentgen radiation. Many observers have called attention to the severe reaction that is frequently seen; it is most alarming when it occurs, and is very likely to cause considerable anxiety; in the person of good physique it is not likely to result seriously, but in the weak and debilitated it may lead to serious consequences; the intense, rapid inflammation may lead to an extensive cellulitis, with its train of concurring symptoms, and usually follows the course natural to that condition, quite in contrast to the inflammatory reaction that follows the application of the Roentgen ray. On the other hand, cases are often seen in which it appears to be quite impossible

to produce the expected reaction, and the tolerance almost borders on an immunity.

Therefore the difference between the reaction caused by these two forms of radiation may be stated as follows:

1. Exact dosage is possible with these radio-active elements.
2. The personal idiosyncrasies are far greater.
3. The reaction is more localized and more intense.
4. Resolution occurs earlier.
5. There is less damage done to surrounding tissues.
6. That Roentgen burns have been treated and healed by radium is sufficient to prove its wide variation.

While the difference between these two forms of radiation is being compared, attention must be called to those reports in medical literature in which these radio-active elements have been employed successfully in the treatment of cases after the Roentgen rays had failed; yet at the same time a few have been reported under the reversed conditions. These reports, however, have usually been made by those interested in one form of radiation alone, and therefore must be considered accordingly; but to substantiate the idea that there is a difference in effect on the tissue elements there is a third series of cases reported by those who have employed both forms of radiation for some of these troublesome cases. It would seem that it should and would be far better to employ the two forms of radiation, thereby obtaining the desired reaction from each. Under certain conditions the ease of application to the surface necessarily elects the employment of one of these radio-active elements; as such may be cited when cancer exists in cavities, as, for instance, in the mouth, rectum or vagina.

In cancer of the uterus, radium seems to possess a control that is not observed from any other form of treatment, and while it is rarely permanent it gives

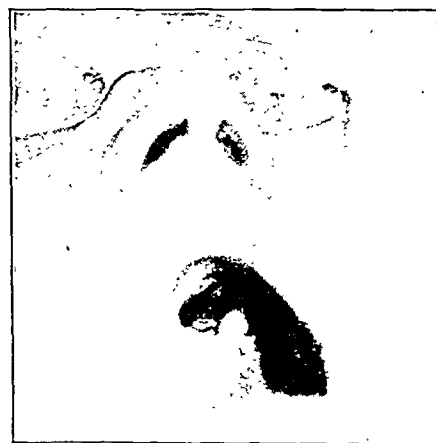


Fig. 3.—E. S. Epithelioma of palate perforating the nasal cavities. Notice the damage. Healed by applications of 4 mg. radium element. (From records of American Oncologic Hospital.) Referred by Dr. H. R. Wharton.

comfort to the patient and materially alters the course of the disease.

These elements can be applied in cavities in which it is impossible to bring the radiation from the Roentgen tube without penetrating the intervening tissue, and it is in this field that the results from these elements seem to be somewhat better than those from the Roentgen ray. Such conditions as polypi within the larynx can be treated without the injury that

leaves the imprint of previous treatment on the overlying skin. In some instances carcinoma of the palate and others of the buccal mucous membrane have been healed. It must not be understood, however, that these radio-active elements are a panacea for cancer; they are far from it; but individual results are often seen that are most gratifying and excite our enthusiasm, though this is not the rule. Here, again, many by their interest in these radio-active elements have in



Fig. 4.—Rodent ulcer of ala of nose; ulceration; was treated during the spring of 1909 by 1 mg. of radium element and remained healed until 1913 when it was again healed by applications from a specimen containing 11 mg. radium element. (From records of American Oncologic Hospital.) Referred by Dr. A. Hewson.

their haste forgotten to look back on the number of patients "cured" by the Roentgen rays. (The word "cured" can certainly be used in its fullest meaning; objection, however, should be made to its employment as a general rule.)

To prove these instances it might be well to recall a few cases that have come under observation and treatment.

CASE 1 (Case of Dr. H. R. Wharton's).—A man, aged about 60, who suffered from an inoperable carcinoma of the cecum, was treated with the Roentgen rays. Four years have elapsed with no recurrence and he is still in good health.

CASE 2 (Case referred by Dr. Chandler).—A woman, aged about 40, suffering from an inoperable carcinoma of the pylorus, irregular in shape and about the size of two fists, was treated. Seven years have elapsed and she is still in good health.

CASE 3.—A patient with recurrent carcinoma of the breast, referred by Dr. McClary, treated seven years ago, is still in good health.

CASE 4 (Reported by Dr. Shoemaker).—A woman, with an inoperable sarcoma of the pelvis, with extensive involvement, and about the size of a seven months' pregnant uterus, was treated about ten years ago; the whole mass disappeared and pregnancy resulted twice afterward; when last heard from she was living in the West and was in good health.

Certainly the superficial epithelioma is in most instances promptly relieved by both forms of radiation, but here radium has so many rivals that its only recommendation is the popularity of its cost. The cosmetic results are exceptionally good, and possibly in those cases in which the Roentgen rays have failed, radium often promotes the desired result. In many reports the term "rodent ulcer" is used to signify all small epitheliomas occurring on the face; this is unfortunate, as the usual form is the proliferative fungoid type, which is far from being so malignant.

The true rodent ulcer with its undercut edges, which has penetrated below the superficial tissues, is rarely cured by any form of treatment. Epitheliomas or recurrent epitheliomas appearing on scar tissue of low vitality are also as a rule unfavorable cases for either form of radiation.

In deep cancer the choice between massive doses of deep radiation and the employment of these radio-active elements must be considered an open question. Its employment in new growths as sarcoma and fibroma is a matter of individual opinion, and results have been reported from advocates of both; the only possible advantage of these radio-active elements is the ease of manipulation. But it should be remembered that the failure of one form of radiation is no criterion of the other.

There is one field, however, in which these radio-active elements displace the Roentgen rays: that is, in the treatment of nevi, either the simple port-wine stain and the deeply pigmented mole, or those with slight vascularity to those of the deep cavernous variety. While these lesions have been treated by the Roentgen rays, the method is extremely dangerous and the results are usually poor. On account of the vascularity, the character of the burns sometimes produced will cause ulcerations that last for years, and when healed give rise to scars with more or less telangiectasis that are as a rule more unsightly than the preexisting nevus.

The amount and quality of the radiation from these radio-active elements are, at present, still an issue to be decided, although some authors have given support to the prevailing idea that beneficial results depend largely on the amount of radio-active element. This, however, is not the fact, and several instances have come under observation in which very small amounts of radium, used merely as a placebo, completely healed one epithelioma perforating the palate between the



Fig. 5.—Sarcoma of orbit, recurrent, treated by 11 mg. radium element. Growth caused a bulging of the temple about the size of a small split apple. Referred by Dr. Swenck. (Records of American Oncologic Hospital.)

nasal and buccal cavity, and another between the buccal cavity and the cheek. The first case was referred by Dr. H. R. Wharton and the second by Dr. J. B. Deaver. They were both inoperable. These results are frequently seen in all fields of radiology, and one should never despair until the individual case has been given the benefit of the doubt.

The comparison of dosage between these two forms of radiation is an impossibility; the existing difference

in their physical nature, their physiologic action and the mode of application does not permit it. The wide difference of opinion existing between individuals using the same form of radiation makes it difficult to analyze the results, which in all events depend largely on the manner and skill of employment rather than the quality and quantity of apparatus. Therefore at present dosage in all fields of radiation is a variable quantity that must depend entirely on the opinion of the operator.

From this short analysis of the two forms of radiation we may conclude that:

1. Both forms of radiation have wide ranges of usefulness that differ materially under certain conditions of disease, individual idiosyncrasy and adaptability of usefulness to the affected part.

2. There is, however, a wide middle ground in which the two forms of radiation overlap, their employment being a matter of convenience.

3. The use of both forms of radiation will in some instances yield results, when one alone would fail.

Therefore, those employing these radio-active elements should have a knowledge of Roentgen radiation. Experience is also necessary with either form to obtain results, and, furthermore, to guard against untoward effects that are so commonly seen.

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THE PLACE OF THE ROENTGEN RAY IN THERAPEUTICS *

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The purpose of this paper is to present in abstract form certain information concerning Roentgen therapy with the essentials of which physicians in general should be quite familiar. That this is not the case, however, is proved by the questions so frequently propounded to the roentgenologist by his professional brethren, which questions display frequently a profound ignorance both of what may be obtained in the way of results by this method of treatment and the reason why such results may be expected to follow treatment. The deleterious effects of radiation on tissue (thanks to the unfortunate series of accidents occurring in the early history of the use of this agent for diagnostic purposes) are perfectly familiar to the profession; in fact, it was the occurrence of so-called Roentgen-ray burns following exposure for diagnostic purposes that first suggested that an agent capable of such destructive influences on healthy tissue might be possessed of considerable power as an alternative agent on pathologic tissue.

Beginning with the use of the ray as a depilatory and as a stimulant in the hands of the dermatologist in chronic acne, eczema, etc., experience soon taught that profound effects could be produced on superficial lesions. This was followed by experiments in the treatment of goiter, lymphatic leukemia and tuberculous glands as well as the superficial forms of malignancy, until within the last few years a new field has been opened by the employment of heavy doses with decided filtration in the treatment of gynecologic lesions deep in the pelvis.

It is thus seen that a wide range of activity has been shown to be possessed by this agent, and it is small wonder that many physicians are unable to understand how a radiation can so profoundly influence such widely different structures in such varied situations. Therefore a word of explanation of some elementary principles of Roentgen therapy: The Roentgen-ray manifests its physiologic action only on those tissues in which it is absorbed. The most striking illustration of this is shown by Pfahler, who in treating a sarcoma of the neck with deeply penetrating rays produced a dermatitis on the opposite side of the neck. It is therefore necessary in attempting to effect tissue changes of a beneficial character in pathologic tissue to employ tubes capable of emitting a radiation having sufficient penetration to reach down to the lowest portions of the affected tissue. In general, this is accomplished by a variation in the vacuum of the tube, the high-vacuum tube emitting high radiation, the low-vacuum radiations of slight penetration. By means of the unique tube invented by Dr. Coolidge, it is possible to handle the tube and apparatus so as to cause emission of large quantities of radiation having a uniform and predetermined penetration; but with all the usual forms of Roentgen tube, a variety of radiations are emitted not in uniform proportion to each other. A high-vacuum tube, for example, will emit rays of high penetration and in addition a variable quantity of rays of much lower penetration depending on the age of the tube and the amount of seasoning to which it has been subjected.

It is possible to handle a tube so as to produce a peculiar condition of stability of vacuum, constituting what is known as a seasoned tube, in which the proportion of rays of high penetration will be quite great and the proportion of rays of lesser penetration emitted relatively small.

It is further possible by interposing filters of leather or aluminum between the tube and the tissue under treatment, to intercept practically all the soft slightly penetrating rays, thus subjecting the tissue to a bombardment of rays consisting almost entirely of those of a predetermined and desired penetration.

The deeper the lesion to be attacked lies beneath the surface, the greater the penetration of the rays necessary to affect it, while the more superficial the lesion, the less the penetration of rays desired. This is highly important, as for example in the treatment of a patch of lupus situated on the forehead, if the operator should use tubes of high penetration, he would probably succeed in producing some results on the lupus due to the rays of lesser penetration emitted by the tube, but prolonged treatment would be necessary, since the majority of rays emitted would pass completely through the lesion and be intercepted in the bone of the skull and the end-result would be a periostitis, necrosis and exfoliation of the bone underlying the lesion. I have seen this produced in several cases in which the enthusiasm of the physician possessed of a piece of new apparatus was greater than his experience in its use.

In the treatment of superficial lesions, tubes of very low penetration without the intervention of filters are required. A few applications of the radiation from such tubes is sufficient to provoke in the skin a violent reaction, which is followed frequently by the disappearance of the lesion and its replacement by healthy scar tissue. Under such circumstances, a large

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

majority of the radiation emitted from the tube is absorbed in the tissue involved by the disease, and the action of this radiation when it is absorbed on diseased tissue is a profound one. This is not the time or place to produce a voluminous condensation of the literature on this subject, interesting as it might be to discuss the histologic changes manifested in tissue that has been exposed; but the whole thing can be summed up in a few words which are sufficiently accurate for our purpose and which may explain why such a treatment is followed by results either good or bad.

Normal human tissues in health are possessed of a certain degree of vitality. They react to various stimuli, electrical, chemical or mechanical, in a uniform degree. Healthy tissue possesses a certain degree of physiologic resistance to irritating or destructive stimuli. It is also possessed of certain well-marked reparative powers when injured.

Diseased tissue, on the contrary, is in an entirely different condition. If malignancy, for example, be present, the tissue is composed of rapidly growing cells with changed structural relations, blood-supply of hasty construction, and tissues showing physiologic variations multiplying rapidly with small powers of resistance and slight reparative power. If such tissue be subjected to quantities of radiation correctly prescribed and administered, it will undergo tissue death either slowly or *en masse* according to the degree of rapidity with which the dose has been administered. Small doses of radiation, or radiation of so high a penetration that but little is absorbed, may on the contrary only stimulate and irritate such a lesion, and instead of producing beneficial results is prone to be followed by exacerbation of the growth. Relatively enormous doses are sometimes necessary, and the physician who desires to employ radiotherapy should have the ability to recognize the necessity of such doses and the necessary skill and apparatus for the prompt administration of them when required. In one case which I shall show in which the result was very satisfactory, it was necessary to administer on several occasions 800 times the customary dose at a single sitting, since the ordinary dose merely stimulated the disease. The treatment of skin carcinoma and epithelioma has undergone a decided change in the last few years. The aim of the successful roentgenotherapist at present is to produce a curative reaction as promptly as possible. He no longer hesitates with tentative doses but boldly proceeds to administer promptly quantities of radiation carefully predetermined that are followed by prompt results.

We frequently see cases of epithelioma about the face near the eyes that have been treated for periods of months by men of slight experience whose timidity has compelled them to attempt small doses perhaps daily instead of a few real treatments. The result is usually a chronic ulceration in a markedly atrophic area, sluggish and almost impossible to treat by any other means than excision. These are the cases in which "the x-rays have been found unsuccessful," but the failure in obtaining results is not to be wondered at. It would, however, be remarkable if favorable results were obtained under such circumstances. The treatment of superficial lesions, therefore, has been accomplished by the rapid administration of a sufficient quantity and quality of radiations to produce a reaction sufficiently intense to be followed by the

ordinary healing process, and that this is possible in the hands of any man who is willing to devote sufficient time to become familiar with the necessary technic should not meet discussion or doubt. The results obtained in superficial malignancy, lupus, rodent ulcer, etc., are not excelled by those obtained by radium or any other means of treatment.

In the treatment of deep-seated conditions an entirely different technic is necessary. In the treatment of inoperable or recurrent malignancy, a certain amount of inhibition of the growth, sometimes quite marked, may be expected to follow rational treatment. Rays of penetration sufficient to reach to the uttermost borders of the growth must be employed, tubes giving a large proportion of highly penetrating rays are necessary, and filtration sufficient to absorb all rays of slight penetration is imperative. If the sole-lead filters of Pfaliler are employed in conjunction with one or more millimeters of aluminum, large quantities of radiation may be applied with but little deleterious effect on the skin if the tubes are placed at a distance of 8 or 10 inches from the surface. Under such circumstances, large masses of tuberculous glands have been rapidly resolved at the hands of many reporters, interesting results may be obtained in cases of Hodgkin's disease and various forms of leukemia, and pituitary struma may be inhibited to a marked degree. Mediastinal involvement in malignancy has been controlled in my hands as well as in the hands of many other men for periods of one or more years.

The value of postoperative radiation as a measure of insurance against the recurrence of malignancy following operative procedure is a question that is still under discussion; I am convinced that it possesses decided value, although such a statement undoubtedly does not admit of positive proof.

The so-called deep therapy of gynecologic lesions is attracting marked attention abroad. In these conditions in which the induction of an artificial menopause is desired and contra-indications to surgical procedure exist, treatment with highly penetrating radiations through selected portals of entry with measured doses is capable of producing cessation of hemorrhage and even of ovarian function. Such treatment demands the highest degree of roentgenologic skill and technic since the doses necessary are so large as to be capable of the most destructive effects on the skin. Attempts at this technic by those who are unqualified will be certainly followed by such a series of disastrous results as to cast discredit on the whole subject of Roentgen therapy.

The Coolidge tube, an American invention, the product of the genius of Professor Coolidge of the General Electric Company, opens a new field in Roentgen therapy. This tube differs decidedly from the ordinary Roentgen-ray tube. Briefly, the cathode consists of a spiral of tungsten placed about $\frac{3}{4}$ inch from a heavy tungsten target. Both these tungsten elements are mounted in an ordinary Roentgen-ray bulb which is then exhausted by a special series of processes to an almost perfect vacuum. In this condition the tube permits the passage of no electric current, and in order to render it operative it is necessary to heat the tungsten spiral by the passage through it of an electric current of 12 volts from a storage battery. The storage battery, rheostat, ampere-meter and tungsten spiral form an electric circuit. The incandescence of the spiral is controlled by permitting the passage of more

or less current by means of the rheostat. This storage battery circuit is carefully insulated, and on the storage battery circuit there is impressed a potential of from 50,000 to 100,000 volts from a high-tension transformer, whereupon tungsten electrons from the incandescent spiral are hurled across the gap in the vacuum, striking on the tungsten target, and from the points of impact Roentgen-rays are emitted. This tube permits the passage of enormous quantities of current for long periods of time, resulting in the emission of great quantities of Roentgen rays. The penetration of rays depends entirely on the voltage impressed on the tube circuit, and if this be kept constant, the penetration remains constant. There is thus placed in the hands of the roentgenologist an instrument of precision and of extreme power, but it must be remembered that he is dealing with a two-edged sword. It is greatly feared that the introduction of this tube will be followed by a series of grave accidents, both to the roentgenologist employing it and to the patients who may be subjected to its use, unless exceeding care in technic is scrupulously followed. The employment of aluminum filters of at least 3 mm. thickness is advised when this tube is used for deep therapy.

The excitement occasioned by the discovery of large bodies of radium-bearing ores in the United States has been followed by an increase of interest in the use of this element for the emission of radiations of therapeutic value. There is no longer any doubt of the distinct value of radium rays under certain circumstances in the treatment of certain malignant conditions.

In my opinion, the greatest field for radium therapy lies in the treatment of malignant conditions in the otherwise inaccessible portions of the body, carcinoma of the esophagus, of the body of the uterus, of the bladder, of the tonsils and antrum, and in the treatment of giant-cell sarcoma in which it is possible to introduce tubes having a heavy radium content into the body of the growth by surgical means and permit the radium to remain for considerable time. Radium will by no means supplant the Roentgen ray in the treatment of these conditions, but will rather supplement such treatment as the Roentgen ray in its turn so ably supplements scientific surgery to-day. A most interesting corollary is observed in the successful treatment of the malignant keratoses produced on the hands of the roentgenologist by long exposure to the Roentgen ray. In a number of instances which I have observed, fingers which demand amputation on account of multiple malignancies have been saved by the application of radium and are now covered by apparently normal and healthy epithelium. The explanation of this fact is not yet clear.

SUMMARY

1. The Roentgen ray is of distinct value in the treatment of a number of conditions.

2. It can never supplant, but can and does supplement, surgery to a valuable degree.

3. The results to be expected depend on the employment of a correct technic which implies the ability to prescribe correctly and administer the necessary dosage at the necessary time in each individual case.

4. The Coolidge tube has placed in the hands of the profession an instrument capable of great good if carefully and intelligently employed.

5. The value of radium as a therapeutic agent should be no longer disputed.

6. The physician employing these various agents must be thoroughly familiar with the possibilities of present-day surgery as well as expert in his own technic in order that his patient may obtain the benefit of everything that science has to offer.

7. Physicians and the public must never forget that every case of malignancy remains for a certain length of time after its inception a curable disease by proper surgical procedure.

Jenkins Arcade.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. NEWCOMET AND JOHNSTON

DR. HENRY K. PANCOAST, Philadelphia: A most important difference between Roentgen rays and the "gamma" rays of radium, is in their manner of production. "Gamma" rays are produced at the time of disruption of the atom, and Roentgen rays at the time of impact of the negative corpuscle, hence the greater and more uniform degree or penetration of the "gamma" rays. All roentgenologists realize that we are again in a developmental stage with roentgenotherapy, and that in the next few years much more will be accomplished, especially in deep treatment. This will be brought about mainly by the combined use of the Coolidge tube, cross-fire radiation and adequate filtration. In the treatment of superficial lesions, everyone now employs massive dosage, one or a very few applications being all that is necessary to control the disease. If this principle is applied to deep lesions, and a massive or erythema dose is directed at the site of the growth by cross-fire methods, similar results should be obtained in many cases. One of the most important applications of deep therapy is in the treatment of uterine fibromas. Results may have been such as to substantiate the claim for this as the preferable method of treatment, but I can hardly accede to such a view at present. I still believe that roentgenotherapy should be reserved for selected cases in which radical operations are undesirable, refused or contra-indicated. Much can now be accomplished even in uterine carcinoma. Finally, while roentgenotherapy will never be a panacea for deep-seated cancer, we feel sure that future results will surpass those of the past.

DR. ARTHUR F. HOLDING, New York: The application of radium as we find it is confined to small areas. The tubes are small and can only be applied to small areas and in order to treat large areas the method of emanations in vacuum tubes is possible. This is an important advance in the use of this radium for malignancy. I think there was no mention made of the use of the emanations for constitutional diseases. The results of radium are usually obtained in the treatment of superficial lesions but Van Noorden and others have used it in many other conditions, using the emanations in a closed chamber. Very little work of this kind is done in this country. We must consider both the local and general reactions of radium. So far as we have gone now we use both of these agents in the same class of patients. As we have more experience with these two agents we can use them according to the case. Those who have had the most experience with the Roentgen ray think most of it and the same holds true of radium. The most important thing to recognize is that there are certain classes of cases that can be adequately handled by any one of these agents: it is not the question whether one is better than the other. You can get a better cosmetic result without opening lymphatics, etc., by these physical methods. The Roentgen rays were discovered in 1895 and we are just beginning to think we know a little about this agent. We do not know as much about radium and in order to find out we must cooperate with the physicist. At present radium is difficult to obtain. The Roentgen ray and desiccation do very well in the same class of cases as the radium. Care must be used in selection of cases for treatment with radium or the Roentgen ray. The

Roentgen ray has a great deal of power for superficial healing and therefore care must be taken in its use. Sometimes there is marked healing and everything pathologic that is visible disappears under the radium, but the patients develop marked cachexia. There is danger in attempting too much.

DR. WILLIAM DUANE, Boston: It has been discovered that the Roentgen ray from a tube really consists of two different kinds of ray. The penetration of one kind depends on the voltage, and the penetration of the other depends on the substance used as an anticathode. Roentgen rays have been found to be similar to the ultraviolet light, although for seventeen years it was thought that they were quite different from ordinary light. It has recently been discovered that Roentgen rays are light waves of exceedingly short wavelength. The shorter the wave the more penetrating it is. It has been shown that the wave-length of the Roentgen ray depends on the nature of the anticathode in the tube. I want to emphasize the fact that the rays from the tubes are of two kinds, one depending on the voltage and the other on the nature of the anticathode.

DR. A. L. GRAY, Richmond, Va.: I have had no experience with radium except some years ago in treating one or two tumors on which I was using a very small amount and of low radio-activity. I obtained no results with the specimens I used. I have now been actively engaged in Roentgen therapy for some twelve years, and my results are as good as if not better than at first and my enthusiasm has never waned in the slightest. I have not been employing deep therapy except in the treatment of tuberculous adenitis. My results have been almost uniformly good in these cases by the fractional method of treatment. I am now using massive dosage, and have been for a short time, but I can not yet definitely report results. Those who have been for some time employing the massive-dose method report that they are experiencing better results from it than they formerly did by fractional dosage. It is more satisfactory to the patient as well as to the operator, and the end-results, so far as I know, are equally as good as if not decidedly better than by the fractional method.

DR. JAMES W. HUNTER, Norfolk, W. Va.: Has anyone had any experience in deep therapy with the Coolidge tube and if so, does he employ filters? I have tried some work on deep therapy with excellent results but I do not encourage it very much. I should also like to ask about the use of filters of thin sheet lead used in the same manner that radium is employed.

DR. GEORGE E. PFAHLER, Philadelphia: I have been interested in the deep therapy and have been using the Coolidge tube a great deal and am enthusiastic in its use and results. It is exact and capable of delivering anything we wish. We can give enormous doses in a short time and it enables us to multiply our fields of entrance so as to give a single dose through any part of the skin and yet multiply the deep effect as many times as we wish according to the time and energy we wish to put on the patient. We have to-day an agent that is, I would estimate, one hundred times more valuable in the treatment of deep-seated diseases than we had at hand a year ago. We cannot report wonderful cures at present, as a sufficient time has not yet elapsed. We have the right to expect results we have not heard of before. We cannot cure all cancers no matter what we do, but I believe we can increase our end-results very much within the coming year. I refer to one case as an illustration of what can be accomplished by the newer technic. Dr. Barton Cook Hirst operated on a woman in May, 1913, and found the entire viscera matted together by carcinoma. The abdomen was closed and the patient developed progressive symptoms of obstruction of the bowel and intense pain requiring morphin. The family physician sent the patient to the dispensary under my care with a note asking me to give her treatment, for a mental effect, and possibly for the relief of pain. I said I was willing to try what could be accomplished and I therefore at once divided the abdomen into thirty-five areas and sent through thirty-five full doses (that is, all the skin could stand). Therefore, the deep part of that disease got thirty-five times as much as we could have given this patient a few

years ago. I should add that I repeated this dosage in two weeks and in several areas got rather a severe burn of the skin. I believe we should never repeat it in two weeks and probably not in less than three. This treatment begun in December. I sent her back for examination a week or ten days ago and the only evidence of the former disease was a little resistance in the left iliac region; all the rest is soft and the patient is enjoying good health. This is thirteen months after she was given up as hopeless. This will serve as an example of what we probably can hope for in the future and which we could not do in the past.

DR. G. B. MASSEY, Philadelphia: Probably the most useful result of Dr. Johnston's showing and of Dr. Pfahler's case is to offset rather a bad impression prevalent in the medical profession as to the inefficacy of the Roentgen ray in cancer. I hear a great deal of discouraging talk about it. It is my belief that the cause of a great deal of this is the inefficiency of the operator. The Roentgen ray is used too carelessly. It is used by men who do not look after their work properly, delegating it to nurses, and by those who do not know what they are doing themselves. It is also true, as Dr. Pancoast says, that each of us has his own method, in which he is most efficient, though there may be several ways to treat some of these cases. While it is very true that the progress of the future will depend largely on the development of personal efficiency in definite methods, an equally important thing is to realize that there should be a selection of methods that are really best in given varieties and stages. It may be that the method we use is not the best in a particular case. To me, for instance, it is absurd to use the Roentgen ray or radium for a small epithelioma of the skin no larger than a pea, and flood the body to an unknown depth with this force, when in ten minutes it could be destroyed by ionization or desiccation. As far as I know the use of the Roentgen method in the mouth has been ineffectual in growths of the mucous membrane; here we have a vast field for the ionization process. We must cultivate the several varieties of the physical forces as they are developed and applied in this work as well as our own efficiency; the best results are by the combination of both.

DR. WILLIAM L. CLARK, Philadelphia: I am convinced that the massive-dose, cross-fire method of applying the Roentgen rays is more productive of results than the small divided-dose method, especially in the case of malignancy. I believe that the Coolidge tube offers great possibilities on account of greater penetrating power and refinement of control. It has been declared that on account of shorter wave-lengths, the gamma rays of radium may be approximated or even duplicated. If this is true, the whole range of Roentgen ray and radium effects could be produced at will, and the whole subject revolutionized. Since the "desiccation method" has been mentioned several times in the discussions I may briefly allude to it. I have depended on desiccation entirely in the superficial epitheliomas, but in more advanced cases the efficiency is increased by employing the Roentgen rays in conjunction. I have found that as much can be immediately accomplished by one desiccation application as can be accomplished by the Roentgen rays in a comparatively long period of time, but in combination the efficiency of both is increased, doubtless due to the action of the Roentgen rays on pathologic tissue deeper than can be reached by desiccation.

DR. GEORGE C. JOHNSTON, Pittsburgh: I do not claim that the Roentgen ray is the cure for cancer. Every case of malignancy in its inception and for a certain length of time following is a curable disease by surgical procedure if it is possible to remove the disease completely. Every man who practices roentgenotherapy should associate himself freely with a competent surgeon so that he may know what surgery can do and hence will not deprive his patients of proper surgical procedure. When surgery does not prove successful or in certain locations such as the eyelids, for example, when better results may be obtained by radium or Roentgen ray, we are justified in using these agents. There is no difficulty in obtaining radium if one will pay the price for it. Nine-

tenths of the radium reports mean nothing because they do not specify the amount of radium element employed. In this country, at present, a great many men are working with tubes containing what they believe to be radium and for which they have paid a radium price but which really contain little, if any, radium element. I believe that radium has a distinct use, especially in locations which are inaccessible to the Roentgen ray, and there is no doubt in my mind that excellent results can be obtained if proper quantities of radium element are intelligently employed. Radium is a necessity in the treatment of chronic Roentgen dermatitis seen on the hands of roentgenologists. There is no other agent that will produce the results obtained by radium in the treatment of these conditions. The Coolidge tube contains no positive ions. If a Coolidge tube fluoresces green, it is not properly pumped and is not a Coolidge tube at all.

DR. WILLIAM S. NEWCOMET, Philadelphia: I am not interested in the superficial conditions such as epithelioma of the skin because they can be effectively treated by many other methods. While many good results are observed in these deep malignant diseases, these radio-active elements must not be regarded as a "cure all." Formerly 1 mg. of radium salt might be spoken of as having 1,800,000 activity, and another specimen as having 600,000 activity, while the weaker specimen might contain more radium and would actually be a better specimen, as the methods of measurement were very crude. It makes very little difference whether you have 10 or 20 mg. in a given specimen containing the same amount of radium, as the high beta and gamma radiation easily penetrates the debris, and the filtration used is often 3 mm. of lead, which far exceeds the natural filtration under these circumstances. No doubt many of these persons who were supposed to have been deceived a number of years ago, bought the supposed radium at the actual strength, but it contained a mass of thorium products which degenerate rapidly, and made these specimens in a couple of years decidedly weaker. The dealers must not be censured for it, however, as it was a matter of ignorance and not deceit. One condition in which radium far supersedes the Roentgen ray in that of nevi. By means of radium and without leaving a scar I removed a large cavernous nevus from a child who in addition had a greatly enlarged nose. I do not believe this could have been accomplished by the Roentgen ray or by acupuncture of the days gone by. My enthusiasm over radium is partly due to the conditions which yield to it when the Roentgen ray fails. With relation to the position of the Roentgen ray I think that some cases are more easily handled by surgery and the results are better; but in conditions allied to superficial skin epithelioma of slow type the Roentgen ray is to be preferred for the cosmetic result; no tissues are injured and after the lesion is once healed it usually remains permanently healed.

EPITHELIOMA OF THE LIDS*

CARL FISHER, M.D.

ROCHESTER, MINN.

Epitheliomas of the lids require some consideration apart from epitheliomas of the skin elsewhere, because of their proximity to the orbit and sinuses and because of the disastrous effects of destruction of the lids on vision and on the appearance of the patient. A good proportion of these patients do not consult the ophthalmologist but are sent to the general surgeon after a long course of salves, pastes and Roentgen-ray treatment.

I have been able to study eighty-eight cases of epithelioma primary in the lids and canthi, or involving

them from the skin in the immediate vicinity (nose, cheek, brow), having chiefly in mind the prognosis of operative treatment. The statistical data were collected to serve as a basis of comparison with other methods of treatment, especially radium. It should be added that the diagnosis in all cases was confirmed by microscopic examination.

The epitheliomas of the lid all belonged to the type known as basal-celled, or, to use a rather popular term, rodent ulcer. By this is commonly meant clinically a cancer of the skin of very slow growth, with no tendency to glandular metastases, spreading by continuity, and usually ulcerating as it progresses. Pathologically, it is somewhat more difficult to define, though this is perhaps of no great consequence to our present object. Adami¹ sums up the present view of this class of epithelioma.

Krompecher, recognizing that all conditions classified as rodent ulcer do not belong to the type, has labeled this form basal-celled carcinoma, on the mistaken ground that, as it shows no prickle cells nor keratinization, it is derived wholly from the basal, undifferentiated cells of the rete Malpighii. But this is so also for all epitheliomas. In the more highly developed forms the prickle cells present do not arise from pre-existing prickle cells, but also from basal mother cells. It is the stage of undifferentiation and anaplasia—the capacity to develop beyond a certain point—that determines the form of the cells.

After the growth has progressed, both basal and squamous cells are to be found in the field, one or the other predominating. Sometimes the appearance may closely simulate sarcoma from the tendency of the epithelial cells to assume spindle forms. I have seen this mistaken diagnosis made several times in epitheliomas of the orbit (Figs. 1 and 2).

In this series the average age of incidence was 53 years. The youngest patient was 24 years old. The average patient waited five years before coming for treatment; many of them from fifteen to twenty-five years; these latter mostly began as keratoses and small wart-like nodules. Some developed rapidly, that is, in one month.

The favorite points of origin were the lower lid (46 per cent.), the inner canthus, over the lacrimal sac (36 per cent.). The next most common point of origin was the upper lid and, least common, the outer canthus.

Of the cancers of the lid, considerably over half originated in the skin of the lid just away from the cilia, the others starting indifferently on the very margin of the lid or the base. There seems to be no obvious reason why the lids should be so favorable a site for the development of epithelioma. The fact that the lower lid and inner canthus are so much more commonly affected might be attributed to the irritation caused by tears and foreign matter. Certainly these regions are usually hyperemic when the upper lid and outer canthus show comparatively little evidence of irritation. In only one case was the pressure from eye-glasses a probable source of the initial irritation, which is so commonly looked for. The type of skin well recognized as a fertile soil for epithelioma—a dry, rubicund skin, seen most often in blond people exposed to the elements—was very often seen, but by no means predominated.

The majority of these cancers progressed by invasion only, the first step being attachment to the peri-

* Read before the Section on Ophthalmology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

* From the Mayo Clinic.

1. Adami: General Pathology, Philadelphia and New York, 1908, p. 735.

osteum of the orbital border, then progression into the orbit and conjunctiva. In several cases the inner orbital walls were destroyed. Occasionally the antrum was involved, and more often the ethmoids, rendering successful operation very difficult.

In five cases, cervical or parotid glandular involvement was present when the patient was first seen. These two groups of glands drain all of the skin and the conjunctiva, while the orbit drains into the internal maxillary group and thence into the deep cervical. Unsuccessful treatment seems to favor glandular involvement, since, of these five patients, only one had escaped pastes or Roentgen rays previous to examination in our clinic, and about the same proportion was found in epitheliomas of the cheek with glandular involvement. The type of tumor did not differ microscopically in these cases from that in cases not showing glandular involvement, so that the failure to involve glands is not a necessary characteristic of rodent ulcer. Our pathologic records, however, do not indicate the character of the metastatic growth. None of the patients developed enlarged glands after coming under our observation, which may have been due to the methods of treatment employed.

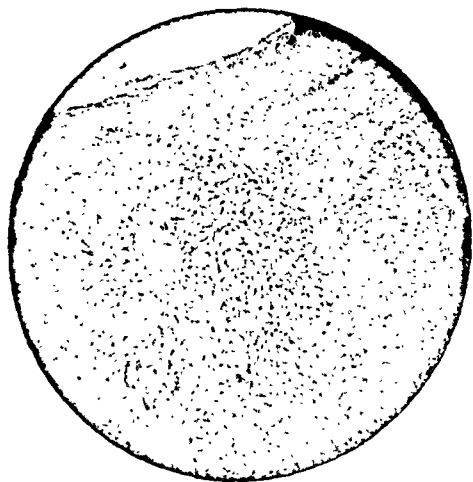


Fig. 1.—Epithelial down-growth showing spindle and oval cells which, when in masses, often look like sarcoma cells.

These patients were treated chiefly in three ways—radical excision, excision with actual cautery of the wound, or simply actual cautery, the method employed depending on the site of the growth and the degree to which it had progressed. Purely cutaneous growths, if small, were cauterized. Growths involving the border of the lid, but not adherent to the periosteum, were excised and a plastic operation done to restore the lid. Where the growth was adherent to periosteum or had involved conjunctiva and orbit, or tear-sac, actual cautery was added to excision. In cases of orbital involvement not readily accessible, an exenteration of the orbit, including the periosteum, was performed and the contents of the apex cauterized. For cauterizing large areas, the soldering iron was found preferable on account of the deep cooking given the tissues—a principle used in Percy's treatment of cancers. Involved sinuses were opened, curetted and cauterized in so far as possible.

The plastic repair of the lower lid is a frequent problem. Many satisfactory results were obtained from the transplantation of a "hammock" flap of skin from the upper lid, a method devised by C. H. Mayo. This flap is soft, of the same color as the normal lid, and grows readily. The operation recently described

by Gibbon² promises to be the one of choice when the lower lid has been largely destroyed. No conventional method will serve every case. The repair is easy when a fair amount of the lid has been left. When, however, the entire lid and part of the cheek have been removed, as is often necessary, large flaps from the temple (as noted in the text-books) give the best results. The Dieffenbach and similar procedures, beautiful on paper, have not proved so successful on patients.

RECURRENCES

This has no reference to final cures, but refers to any recurrence whatever taking place after operation in our clinic. Most of these were small nodules, easily burned off. Of the thirty-three epitheliomas involving the lids and canthi alone (adherent or not adherent), 17 per cent. recurred at some time. These recurrences were all at the site of the previous growth, and not in glands. When, however, the growth had penetrated the orbit, the percentage of recurrence rose rapidly—eight out of eleven. Of thirteen cases involving the orbit, primarily and secondarily, three have passed the one-year period without recurrence. Four others have not yet recurred, but have not gone a year since operation. The time-limit of one year is somewhat arbitrary, but is based on the average time before recurrence, namely, nine months. This is a rather high average, being brought up by a few unusual cases which were reported as having recurred very late. The majority of cases which recurred at all did so in three to four months.

The chief interest in these cases for the clinician lies in the ultimate prognosis. I have not counted as cures cases of less than one year's standing since the last operation or treatment. Naturally, the percentage would be considerably higher if cases of over four months' standing were cited and if all patients were willing to return at the first sign of recurrence.

Of the thirty-three epitheliomas of the lids and canthi, not including the orbit, in which the records have been completed by recent news of the patients, 94 per cent. were cured by operation. When the orbit was involved, the percentage was turned about; 80 per cent. were not permanently cured. These include cases in which the sinuses also were involved. The factors which mitigate against cure are: inner canthus involvement, penetration of conjunctiva or lacrimal sac, orbital involvement and sinus involvement. The cases of glandular involvement cannot be classified because our records are not completed, owing to the lack of recent information of these patients. The one "completed" case had no recurrence after a radical local removal, and dissection of the cervical glands.

The comparison of these results with those obtained by the use of radium or Roentgen rays or pastes is difficult because of the absence in most papers on the subject of definite data regarding the duration of the cure. Williams and Ellsworth, however, are not remiss in this regard.³ Of the nineteen cancers of the skin of the lids, two-year cures are reported in thirteen cases, or 68 per cent. These are evidently not intended to include cases with orbital involvement, since one case of orbital involvement is listed separately. The percentage of two-year cures by operation in our series was 84.

2. Gibbon: Blepharoplasty by a Pregrafted Flap, read before the American Surgical Association, April 9, 1914.
3. Williams and Ellsworth: Treatment of Superficial New Growth by Pure Radium Bromid, THE JOURNAL A. M. A., May 31, 1913, p. 1694.

Pinch,⁴ in a report of the Radium Institute of London, classified his cases of rodent ulcer into apparently cured, thirty-one; "improved," forty-one; not improved, twelve; abandoned treatment, six. Counting improved, not improved and abandoned as failures (as was done in our series), the percentage of cure is far from satisfactory (about 39 per cent.) and this without any minimum time-limit set. It should be said, however, that these were rodent ulcers of various regions and severities, so that the comparison is not altogether fair. Pinch was able to state on this showing that "rodent ulcer is of all cancers the most amenable to radium treatment." Turner⁵ cured six out of nine completed cases of rodent ulcer of various parts of face and lips, or 66 per cent., time not stated. The best opinion at present concerning radium versus operative treatment of these cases is well-summed up by Knox.⁶

"1. In all cases of early cancer, the operative method is undoubtedly best; it is quicker, safer and offers the best prospect of cure. . . . 3. In patients who refuse operation or are otherwise unfit for operation, radium is a useful remedy."



Fig. 2.—The same as Figure 1, except growth is taken from nose.

Comparison of operative treatment with pastes is also difficult. I have found no recent records sufficiently exact to afford a statistical comparison. Perhaps the most revolting, because easily avoidable, pictures of malpractice that one sees are cases of cancer of the skin treated with various pastes, and the inevitable impression received is that the public has suffered unspeakably from the exploitation of the paste treatment. Nevertheless, it must be acknowledged that in the hands of persons practiced in this procedure, many surprising cures are obtained, and these sometimes in apparently inoperable cases. No doubt the continued financial success of certain "cancer institutes" is maintained by a fair number at least of noteworthy cures.

The Roentgen ray is believed to owe what efficiency it possesses to a ray corresponding to the gamma ray of radium, so that there seems to be no reason for preferring it to the latter (save its greater accessibility) since the curative rays are acknowledged to comprise only a small part of the whole Roentgen ray. In point of fact, the Roentgen ray cannot be regarded as a

dependable agent in the treatment of epitheliomas, however useful it may be as a palliative or postoperative measure.

The present evidence seems conclusive that operative measures are, in general, the safest means of treatment we possess for epitheliomas of the lids (and for that matter in any other region), and especially when the growth is rapid and adherence to periosteum or involvement of the orbit has taken place or evidently will soon take place. On the other hand, when the patient can be kept under observation until a cure is completed and the growth is proceeding slowly, there seems to be no good reason why radium should not be used. In cases of this kind, however, it has the disadvantage of slowness, and there is also the difficulty, in most places, of obtaining the radium. But many patients prefer any amount of treatment to the use of the knife, a psychological factor that is heavily featured in the advertisements of the clever charlatans. The cosmetic results of successful radium therapy are excellent; I have seen no injury or reports of injury to the eye from its use; it is practically painless. In this as in any therapeutic or surgical measure, the experience and ability of the physician in charge plays an important rôle, especially in pioneer work with comparatively new methods of treatment.

The importance of early and radical operation in epitheliomas with orbital extension is well emphasized in the statistical data given above. Unless the growth is so clearly circumscribed that complete removal without sacrificing the eye is certain, a complete exenteration of the orbit followed by cautery is imperative. Extension to the sinuses renders the prognosis nearly hopeless; in such cases, if operation is decided on, it should be followed by the persistent use of radium or by Roentgen ray if the former is not available. Glandular involvement, without orbital extension, does not necessarily indicate a bad prognosis, granting that a proper resection of the gland-bearing fascia be made.

ABSTRACT OF DISCUSSION

DR. EDWIN E. JACK, Boston: My own experience with epithelioma of the lids, never in any way comparable with Dr. Fisher's, has been smaller in recent years and offers nothing from which statistics of value can be drawn. It has seemed to me that such cases went more and more to the general surgeon or for Roentgen-ray and radium treatment. The public print too has been busy with this, as with other new subjects in medicine, and it is likely that many choose their own method of treatment—and it is not that by the knife. It seems impossible to disagree with Dr. Fisher in any of the statements he has made. If patients with epithelioma involving the sinuses recover under any treatment I do not know of them. Penetration into the orbit, involvement of bone, situation at the inner canthus—all undoubtedly influence the prognosis for the worse. The surgical technic described by Dr. Fisher represents the last word. From the cosmetic point of view, in any advanced case, of course operation leaves much to be desired, for it is often true that space must be filled in as best we can. In the less serious cases, deformity is less, but the results rarely resemble the almost marvelous ones of successful radium therapy. The greatest point of interest in connection with the subject is the relative value of this therapy and of operative treatment. We have all of us undoubtedly seen cases of small epithelioma beautifully cured by the Roentgen ray and radium, and have seen or heard of authentic like results in larger growths, even in some which offered little hope from an operative point of view. We have, in addition to our own experience in this matter, that of surgeons, roentgenoscopists and radiographers

4. Pinch: Brit. Med. Jour., Jan. 25, 1913, p. 149.

5. Turner: Brit. Med. Jour., March 22, 1913, p. 606.

6. Knox: Brit. Med. Jour., June 7, 1913, p. 1196.

Cornell University, New York City, in a report presented to the Section on Dermatology, classified desiccation surgery as the method of choice for localized epitheliomas. The realm of surgery is a wide one in which desiccation plays only a small part, but in localized epitheliomas and precancerous lesions, such as moles, nevi, etc., especially those of the lids and canthi, there can be but one choice for those who have compared the results of both excision and desiccation.

DR. CARL FISHER, Rochester, Minn.: I wish to reiterate that no one would attempt to insist on any one treatment for lid cancer. There are so many conditions to be considered—the distance the patient lives, his own particular conditions of living, what method the surgeon has had experience in using, accessibility to radium, etc. I do not think that any one would say that all cases should be operated on or that all should have radium. Since Dr. J. F. Percy began treating large uterine cancers with heat below the point of carbonization he has done some wonderful work, and it strikes me that the use of heat below the point of carbonization would be effective in all these lid or superficial cancers, just as it is effective in the deeper-seated cancers. This I have not done in a large enough series to report.

A STUDY OF THREE HUNDRED CASES OF APPENDICITIS WITH SPECIAL REFER- ENCE TO PELVIC COMPLICATIONS*

ARCHIBALD MACLAREN, M.D.

ST. PAUL

I have taken for this study 300 cases of acute suppurative appendicitis, excluding all chronic, subacute, relapsing, and acute cases in which no pus was found. This is a consecutive personal list in which I have not included patients operated on by any of my three partners or by any of my assistants at any of the hospitals with which I am connected. Over 12 per cent. of these patients were operated on in farmhouses or country hospitals, and many of these have been my very worst cases, the patients being so sick that the family physician would not dare to move them. I feel sure from my experience that the cases which reached the metropolitan hospital from the country districts are always to a certain extent selected, and the best cases from an operative point of view.

In this study the especial interest to me has centered about pelvic rectal drainage and its influence on the mortality rate. Rectal drainage in these bad cases was original with me when I first used it, although I later discovered that it had been advocated by McNaughton, Stillman and others, whose publications I had never seen until I had operated on my first eight patients, whose cases were reported five years ago before the American Surgical Association.

I first tried to follow the ordinary method of dividing the perforated-appendix cases into two classes, general septic peritonitis and local appendiceal abscess. I soon discovered, however, that I could not make this distinction with certainty in border-line cases, either before or after operation.

It has been a matter of habit with me in keeping my personal records to note the approximate quantity of pus in each case, and this fact gives me an opportunity to make a division of my cases on this basis, which I believe is one of true value in determining the prognosis. The quantity of pus in a certain case is of great importance. The operation for opening a large

abscess is much more dangerous, at any stage of the disease, than the same operation on a small accumulation of pus entirely aside from its virulence. I have arbitrarily designated 4 ounces as the dividing line for the reason that it is unusual to see a single localized abscess contain a larger quantity. When the quantity obtained is larger than this, there is usually a secondary abscess or involvement of the free peritoneum so that large abscesses can best be grouped with general peritonitis cases for this study.

I have taken 150 consecutive cases before my first rectal section and 150 consecutive cases since that time for a basis of comparison. In the first 150 cases there were 13 deaths, divided as follows: in 61 general peritonitis and large-abscess cases with four or more ounces of pus, 12 deaths; in 34 abscesses with less than 4 ounces of pus, 1 death; in 55 cases without rupture, either gangrenous, or appendixes, containing pus, no death.

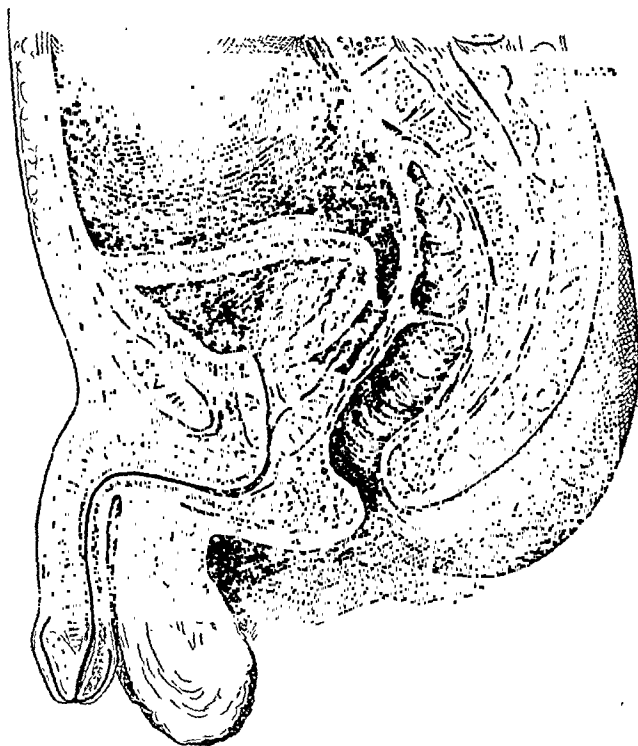


Fig. 1.—Normal midline section left half of pelvis.

In the last division I wish to say that most of these are the acute cases in which the patients are operated on in the first 48 hours of the attack. If the appendix was accidentally ruptured during the removal, the case was included as unruptured. The general mortality, then, is 8.6 per cent. During this same period operation was refused in three fatal cases in the hope that they would safely reach the eighth day (Ochsner). It seems to me that these should be added to the mortality list, which would raise the mortality to 10.6 per cent.

In the second series of 150 cases with operation since the use of rectal drainage, there were 7 deaths, disposed as follows: in 84 general peritonitis and large abscess cases, 7 deaths; in 32 small abscess cases, no deaths; in 34 unruptured, gangrenous and appendixes containing pus, no deaths. This brings the general mortality to 4.7 per cent.

In this second list there were 84 cases classified as general peritonitis as against 61 in the first list,

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

and there seems to be a corresponding fall in the unruptured cases, from 55 to 34. This may be due to the more general use of the Ochsner treatment or to the suspicion of the laity, created by many so-called surgeons who have been rushing to the hospital every kind of case from typhoid to ptosis. The second series includes many more desperately sick patients than the first, yet the mortality rate has been cut in

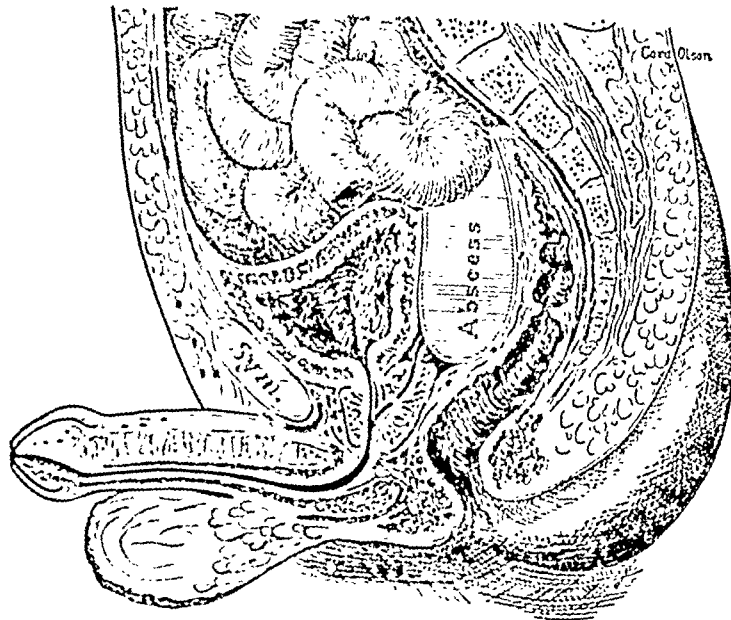


Fig. 2.—Small abscess in culdesac; right half of pelvis.

two by what I believe to be a life-saving surgical procedure.

The question may be asked, What relation has rectal section to these seven deaths? Was any death caused by rectal section?

CASE 1.—The first death occurred after a laparotomy in a very sick child aged 6, first seen on the fifth day. This little girl died in stupor, twelve hours after operation, with pinpoint pupils and a gradually failing respiration. The nurse had given two hypodermatic injections of morphin, each supposed to be 1/12 grain. The first injection had no effect, and on account of her great restlessness two hours later a second 1/12 was given, which was soon followed by death.

CASE 2.—Mr. S., aged 40; sick five days; died the day following the operation, pus having been found all through the abdomen; two abdominal drains, one in the right loin, one through the suprapubic stab.

CASE 3.—Child, aged 7, very ill; first seen on the fifth day with marked pelvic abscess bulging through the anterior rectal wall. Rectal section and letting out a half-pint of thin serous pus; this child was so well for the next three or four days that she was considered out of danger. On the seventh day after the operation she was very sick again; a laparotomy disclosed another large accumulation of pus in the right loin. The laparotomy in this case should have been made on the second or third day after the rectal section. This child died two days following the last operation.

CASE 4.—S. J., aged 25; operated on forty hours after perforation. Drain through the stab just outside of the cross-muscle incision; died on the seventeenth day from general septicemia associated with an erysipelatous inflammation of the abdominal wall and back starting from the incision. Since this case I never use the cross-muscle incision in pus cases.

CASE 5.—Mrs. G., aged 63; operation in farmhouse; sick six days; supposed by her physician to be suffering from renal calculus; vomiting fecal in character for forty-eight hours; laparotomy; general septic peritonitis; two rubber tube-drains, one in the loin and one suprapubic stab into the pelvis; died in a few hours from shock.

CASE 6.—J. O., aged 27; sick thirty-six hours; laparotomy; tube-drain into culdesac. On the eleventh day a rectal sec-

tion was made; quart of pus; death same night: In this case the rectal section was delayed too long. It seems to me that with greater care both this patient and Patient 3 should have been saved.

CASE 7.—G. L., aged 45; sick eight days; operation in a farmhouse; laparotomy; drain in right loin and rectal drainage; did not rally from the anesthetic.

In the first 150 cases there were six deaths; these six cases from their histories, seem to me now to have been suitable for rectal puncture. Three of this number were examined post mortem and the pelvis was found full of pus. The one case which particularly stimulated me to the use of this procedure was that of a boy who died, complaining bitterly because the nurse was inattentive to his bowels and would not bring the bed-pan as frequently as he desired. After death the sphincter was found dilated to an inch in diameter by the anterior wall of the rectum, pressed down by a large pelvic abscess. Thereafter I never considered an examination of any inflammatory abdominal condition complete without a rectal examination.

At first the operation of rectal puncture and drainage was confined to cases in which there had previously been operations for acute appendicitis. The accumulation in the culdesac would generally show itself by night pain, rise in temperature and pulse, and commencing septic appearance about six days after operation. Many times the culdesac was found distended with pus, even when a large-sized rubber tube extended from the wound or from an anterior-wall stab into the culdesac.

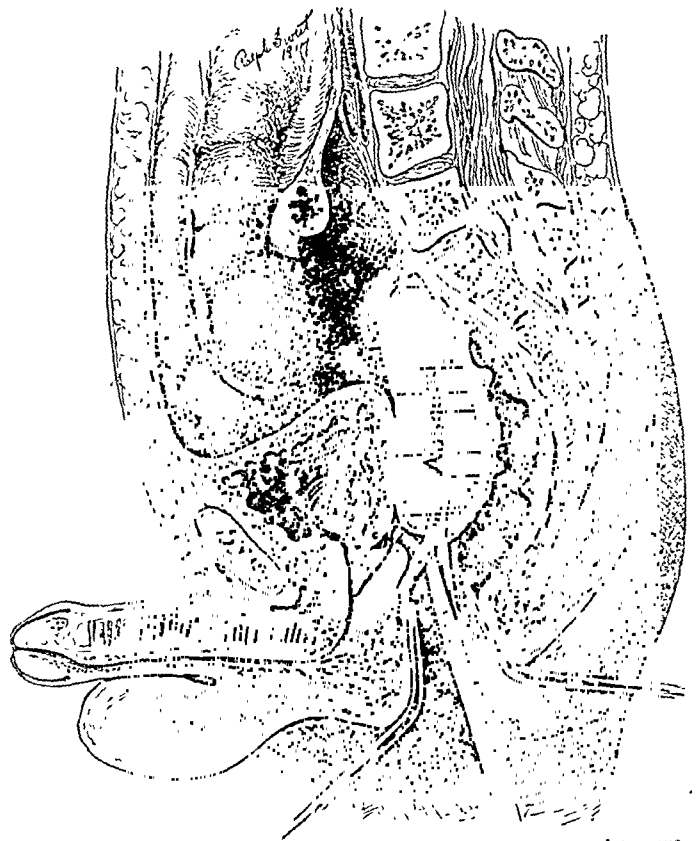


Fig. 3.—Method of opening small pelvic abscess; scissors used to puncture abscess and as dilators.

The reason for this is that intra-abdominal pressure exists at maximum only, when there are no peritoneal adhesions, and that as the adhesions increase in amount and strength the intra-abdominal pressure rapidly decreases to zero. I have several times seen cases, say, ten days or two weeks after operation, in which the drainage wound above was pouring out a perfect stream of pus, while the patient was rapidly losing

ground, owing to septic absorption from a large pelvic abscess. Rectal section in these cases has quickly worked marvelous changes. In one case of this type, a boy seen at the University Hospital, who had a temperature of 102 every night, and was vomiting and so sick that he could not eat, was crying for food, after 2 pints of pus were removed, and this in four hours after the pus was evacuated. He rapidly recovered. After we had demonstrated the great value of this method in the postoperative cases, we extended its use to bad cases of patients seen late in the course of a perforative attack, who had not been operated on. Many of these have been young children who were first seen between the third and the sixth day, dangerously sick, with a marked distention of the culdesac. In such patients in whom the danger is of a back-firing of the pelvic abscess, with a fatal general peritonitis, the first thing done has been the making of a rectal section and the putting in of a winged rubber tube-drain. If the patient was entirely relieved, so far as

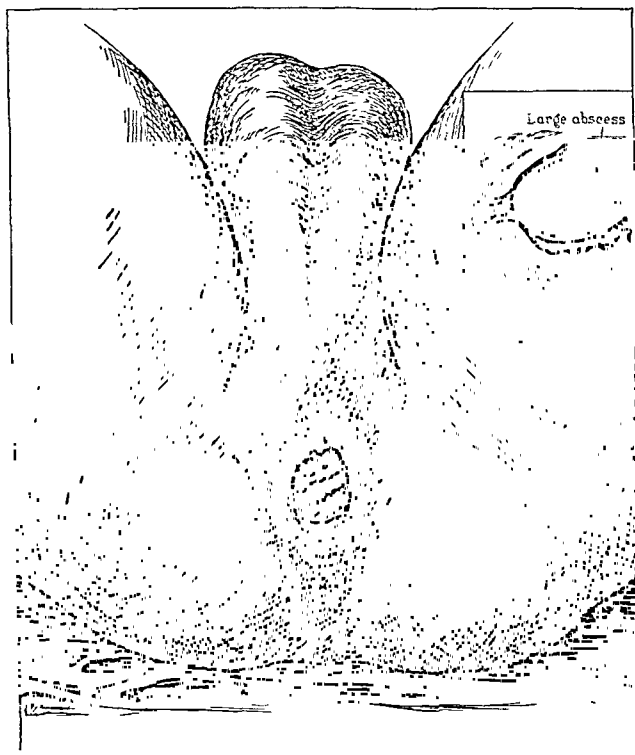


Fig. 4.—Dilatation of sphincter from pressure of large pelvic abscess through anterior wall of rectum.

pain and temperature was concerned, nothing else was done at that time, but usually the very next day, an exploratory laparotomy was done and the gangrenous appendix removed.

I believe in removing the appendix only when it can be done without adding any percentage of mortality to the operative risk. It is surprising how much more one can do toward removing appendixes, however, with added experience.

We believe that the rectal drainage is no more dangerous than vaginal section. In little girls we always use rectal section in preference to vaginal section. Up to the present time we have not used rectal section in adult women, but have continued to drain pelvic abscesses through the vagina, as has been done so successfully for so many years for all sorts of pelvic abscess.

I find that in this last 150 cases, I have considered it wise, to make a primary rectal section 11 times. Secondary to laparotomy I have opened and drained the rectum 13 times, making a total of 24 rectal sections in 150 cases, or approximately 17 per cent.

With the exception of the two patients mentioned above, all the patients of this class treated with rectal section have rapidly recovered and not one has had a fistula. In one case when a large pelvic abscess had resulted from a perforating ulcer on the anterior wall of the upper rectum, drainage through this perforation promptly cured the abscess; when at the end of eight days the winged rubber tube was pulled out of the rectum the perforation promptly closed. Proctoscopic examination in this case two weeks after the tube was removed showed a small scar where the perforated ulcer had been.

CONCLUSIONS

1. The successful treatment of acute appendicitis depends on the time when the patient can be operated on after perforation, the earlier the better.
2. We should continue to impress this fact on the laity.
3. Drainage must be complete and, for a certain percentage of cases, rectal drainage is a most efficient measure.
4. After operation has been performed we must not forget these patients. The method of attack is not so important as eternal vigilance, constant watching and frequent rectal examinations, which should be made, if in the future we are to save some who would have been lost in the past.

914 Lowry Building.

HAS THE LAST WORD BEEN SPOKEN CONCERNING APPENDICITIS?*

JAMES E. MOORE, M.D.

MINNEAPOLIS

In 1582 Ambrose Paré said in the preface to his surgery that he had striven so successfully for forty years to bring surgery to perfection that posterity would not be able to surpass us save by some additions such as are easily made to things already discovered—and all that we have left of his teaching is the use of the ligature.

In 1882 Samuel D. Gross, founder and first president of the American Surgical Association and the leading surgeon of his generation, said, "Operative surgery challenges the respect and admiration of the world, and if it has not attained its finality it is as nearly perfect as we can hope to make it"—and he had never performed an appendectomy.

If these men, who were the greatest in their day, were so mistaken, it would be absurd for any of us to say that the last word has been spoken concerning any topic in surgery, for it is a live subject and while the present generation can justly claim that it has added more toward its perfection than has been added in all time before, future generations will doubtless improve on it to a point far beyond our fondest dreams.

The last word has not been spoken concerning appendicitis, and possibly never will be, because the

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

last word can not be spoken until the mortality from this affliction has been completely obliterated. A few years ago every program for this meeting contained too many papers on appendicitis, but for the past few years they have been too few. We have doubtless all changed our views since we had our last "battle royal;" is it not time, therefore, to review and see how our present views compare? If in our discussion we find that we are nearer of one mind we shall know that we have advanced. If, on the other hand, we find that we are as far apart as ever, we shall know that there is great need for improvement and that we must renew our efforts as though the topic were a new one.

Little has been added lately to our methods of diagnosis. That syndrome, diffuse abdominal pain which later becomes local in the right lower quadrant, vomiting, local tenderness, and muscular rigidity, is one that can not well be mistaken. The average case of acute appendicitis is the easiest of intra-abdominal conditions to diagnosticate, but there are exceptional cases in which the most skilled diagnosticians may be mistaken. Within one month we have had four patients in the University Hospital who had no pain, rise of temperature or vomiting when they were admitted. The evidence on which a diagnosis of appendicitis was made was the history of pain and vomiting before admission, the presence of muscular rigidity, and leukocytosis. In all four a ruptured gangrenous appendix and an abdomen full of pus were found. All recovered, but without operation would surely have died. The most common mistake is to make a diagnosis of appendicitis when it does not exist. Not every pain in the abdomen is appendicitis. In our northern climate pneumonia is frequently mistaken for appendicitis in children. Intussusception has not infrequently been mistaken for appendicitis. Retrocecal appendicitis is now a well-recognized condition, and a positive diagnosis of this condition can usually be made by a careful observer. Muscular rigidity over the appendix is the most reliable symptom of appendicitis, and when a patient has all of the other cardinal symptoms and this one is lacking retrocecal appendicitis should be suspected; and if tenderness can be elicited by pressure in the loin just back of the cecum a diagnosis of retrocecal appendicitis is quite certain. In some cases of retrocecal appendicitis psoas contraction is a marked symptom. Refinements in diagnosis should not be undertaken before operation, because it is a waste of time and a mistake in classification may lead to disastrous delay. The time to decide whether a case of appendicitis is catarrhal, perforative, or gangrenous is after the surgeon has removed the specimen.

The prognosis in appendicitis has become better each year, but there is still room for improvement. Statistics concerning appendicitis are preeminently unreliable, but it has been quite generally accepted that without operation there is mortality of at least 20 per cent. With operation at the present time the mortality rate is near 5 per cent., and in hospitals under expert surgeons it is less than this.

When shall we operate? Every surgeon has answered this question differently at different stages of his experience. Whether he began as a conservative or an extremist he has changed, because he had a mortality rate which he hoped to lower by changing. I began very conservatively, operating only when a well-defined abscess was present. Under this practice the operative mortality was low, but the mortality

from the disease was high. Then came a period in which operations were performed by the calendar, or after careful selection. Under this practice the operative mortality was higher and the actual mortality considerably lower, but still too high. During the past few years the rule has been to operate as soon as possible after the diagnosis was made, and the actual mortality rate has been very much lower than that during either of the other periods. We abandoned the waiting plan because we have learned that while some patients will improve, many will die while we are waiting for a more favorable time for operation, and that no living man can tell what will happen in the next twenty-four hours in a case of acute appendicitis. After long experience with all plans we can conscientiously recommend operation as soon as the diagnosis is made, because it has been accompanied by the minimum mortality rate. We would not recommend this plan, however, for the unskilled operator or in the absence of hospital facilities.

In the Minnesota University Hospital we have had eighty-seven patients with acute appendicitis, all of whom have been operated on as soon as possible, with a mortality of but 3.4 per cent. This excludes all chronic cases and appendectomies made when the patient was being operated on for other conditions. Nineteen of them had extensive suppuration. It is of interest to note that all of our deaths occurred while we occupied the old frame building as a temporary hospital. The last forty-four cases have been operated in the new hospital with no mortality.

H. J. Paterson¹ reports a like experience. During the first period he rarely operated except in the presence of abscess, and never until the acute stage had passed, and the mortality was 16 per cent. During the second period each case was a law unto itself, and the mortality was 13 per cent. During the third period he operated as soon as possible in every case and in 95 cases had a mortality of only 5.2 per cent.

The term "operative mortality" means that the patient died in spite of an operation and not as a result of it. A few years ago a very common newspaper report was that someone had died from an operation for appendicitis. Even the laity have learned that the operation for appendicitis in competent hands is a very safe one, and that people die for want of an operation and not because of it. Christian Science is responsible for many more deaths from appendicitis than operations are. Many lives have been sacrificed and surgery has been brought into disrepute by surgeons who were striving to make a record. The record-maker is an unsafe man in surgery because he is very prone to give his record greater consideration than he does his patients. Every surgeon's actual mortality rate from appendicitis is made up of all deaths occurring among his patients whether he has operated or not.

Shall we always remove the appendix in acute appendicitis? To this question I answer, emphatically, No, because I have known of many instances in which the patient's life has been sacrificed through a determined effort to remove the appendix at all hazards. It should be remembered that the operation is performed to save the patient's life and not to remove the appendix. I have removed the appendix in fully 95 per cent. of cases during the past few years; but there have been a few cases, possibly one in twenty,

1. Paterson, H. J.: *Brit. Med. Jour.*, Oct. 5, 1912.

in which I deemed it safer to leave it. We believe that, at present, every experienced surgeon removes the appendix in the vast majority of cases, but that the best, that is, the safest, surgeons occasionally leave one. When the appendix is in evidence, it should always be removed, but when its removal necessitates the extensive breaking down of Nature's protection and the contamination of the general peritoneal cavity, it should be left for a later operation, when it can be removed with perfect safety. The leaving of the appendix in these exceptional cases with the established drainage is safer than its removal. The fact that leaving the appendix necessitates another operation is of no importance, because this is a matter of life and death and not of expediency. If it were the accepted practice to remove the appendix in every case, many lives would be sacrificed by inexperienced operators.

Should patients be operated on after an acute attack of appendicitis to avoid future attacks? The construction of the appendix is such that recovery is seldom if ever complete, and the fact that the first attack was a mild one gives no assurance that the next one will be. The interval operation is so free from danger, and later attacks of appendicitis are so often very dangerous, that we do not hesitate to advise the interval operation as a routine practice. In child-bearing women the operation should be insisted on.

How shall we treat appendicitis in pregnant women? Appendicitis in a pregnant woman is more than twice as dangerous as it is in a non-pregnant woman, and should be operated on at the earliest possible moment, for admitting that the operation and the accompanying anesthetic are attended with some danger, the disease without operation is infinitely more dangerous. The very great increase in danger during pregnancy is due to the facts, first, that two lives are in jeopardy, and, second, that the mother's condition renders her much more liable to grave complications. Abortion occurs in about 40 per cent. of these cases, which is always a very grave situation, and early operation is the best preventive of abortion. I believe that it is good practice to advise every woman who finds herself pregnant after a severe attack of appendicitis in which the appendix was not removed to have an operation as soon as she knows that she is pregnant.

The exact method of removing the appendix and of treating the stump is immaterial so long as it is skillfully done, for different surgeons employing different methods secure equally good results. In suppurative cases drainage is a very important matter, and is very often improperly carried out. It is a very grave mistake to plug the wound with gauze and depend on this plug for drainage, when it only prevents the escape of pus. My personal practice is never to use gauze for drainage except when it is surrounded by a rubber tube or rubber tissue, for it drains only serum and that for only a few hours, when its meshes are filled and it has lost its capillarity.

It is quite a common practice, at present, to place the patient in a sitting position to cause the pus to drain into the pelvis. I have not followed this practice, because it is based on mistaken theory, and it is an uncomfortable position for a feeble patient; and my patients have done just as well as those who were in a sitting position and have been much more comfortable. A few years hence this will be remembered as only a passing surgical fad. No matter what position a patient has been in before operation, with free

pus in the abdomen the pelvis will always be full when it is opened. It is very important to pump out the pelvis in every pus case. Large-sized soft rubber tubes should be passed to the bottom of the pelvis and into the flanks. It is not necessary that they should run down hill, for the intra-abdominal pressure will care for that.

Syndicate Building.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRs. MACLAREN AND MOORE

DR. ALBERT J. OCHSNER, Chicago: Some five years ago when Dr. MacLaren brought out the facts contained in the present paper I recalled several instances in which, undoubtedly, judging from the symptoms, patients whom I had observed should have had this additional treatment. Since that time I have encountered four cases in which this condition existed. In one of these there was an additional condition which might have resulted seriously to the patient had it not been discovered by accident. The patient had a greatly distended bladder so that there were two points of bulging, one point a little lower than the other, which made me suspicious that the bladder might be full and that this entire mass might not be due to the abscess. When the bladder was catheterized the abscess remained, but the upper swelling disappeared. In following the histories of these four cases I found that each patient had been carefully treated for some time by the use of cathartics. The shortest time of treatment was four or five days and the longest eleven days. I have never seen this condition present in any case in which the appendicitis had not been treated by cathartics. Many a surgeon with less skill than have the surgeons in this splendid new hospital referred to by Dr. Moore has a mortality in 100 successive cases of less than 3 per cent. by following a method of treatment of which I have spoken so often before this Association that the older members must know it by heart by this time. If in those cases in which the surgeon is doubtful, or feels that he cannot expect recovery, he inhibits peristalsis by washing out the stomach, performing gastric lavage and giving absolutely nothing, not even water by the mouth, feeding by the rectum, he will find that the mortality in this class of cases will be reduced to less than 2 per cent. Dr. Moore's plan of counting mortality is absolutely correct. Every patient with appendicitis who dies must be counted whether operated on or not. I believe in the Fowler position, and agree with what Dr. Moore said about operating during gestation. The reason the diagnosis is frequently not made is because in these cases the surgeon has not the intelligence or does not give the attention necessary to make a physical examination. Usually a patient who comes without having had an early diagnosis is one in whom the doctor took something for granted, not making a physical examination to begin with.

DR. J. M. T. FINNEY, Baltimore: Dr. Moore's paper was so sane and founded on such good surgery and pathology that it is difficult to disagree with him in any respect. There are one or two points, however, with which I disagree. He said the last word has not been spoken, nor will it be spoken until we have 100 per cent. recoveries. I agree with this statement. In appendicitis, in my judgment, the mortality is absolutely preventable. When a death occurs from appendicitis it is *prima facie* evidence that somebody has made a mistake. When pus is found in appendicitis, it is also *prima facie* evidence that somebody has blundered. It is not always the physician, nor is it the surgeon. It is not infrequently the patient or some officious member of the patient's family who interferes, and doesn't send for the doctor early enough. No case of appendicitis should progress so far as the formation of pus. I understood Dr. MacLaren to say that he had had no mortality whatever in any patient operated on except when pus was present. That is my experience. I think that it is the experience of a great many surgeons. If that is true, and the well-known and safe paths are followed in operating on these patients, I believe that mortality can be absolutely elimi-

nated in operations for appendicitis. This whole question, then, resolves itself into one of diagnosis. If the patient can be seen early enough, and if no mortality occurs in patients with appendicitis operated on except after the appendix has ruptured, it necessarily follows that 100 per cent. of recoveries will occur in patients operated on. That is a proposition which cannot be gainsaid in view of the facts in the case. If, then, it is a question of diagnosis, the thing we should devote our attention to for the time being is to improve our methods of diagnosis. There are ways in which that can be done. I cannot mention them all. Attention should be called to one or two points, however. If one has conscientiously examined his patient, as Dr. Uehsner says, if he has made use of every means at his disposal to make a diagnosis, and if he has failed to satisfy himself as to the existence or not of an appendicitis, if the condition of his patient is such as to make him believe that there is some more or less serious condition, it is the duty of the surgeon to offer, indeed, to insist on, operation. Make the diagnosis at the time of the operation if necessary, don't wait until the patient is as good as dead, and then attempt to do the impossible. That may seem to be an extremely radical position, but it can be backed up by the facts in the case, by statistics, by results, and that is what we are after. I call attention to the fact that appendicitis in children is a very different proposition from appendicitis in adults. I called attention to this fact in a paper some years ago, and reported a long list of cases coming under my observation in which all sorts of bizarre diagnoses had been made for appendicitis or the reverse. I have operated on a great many patients that I thought had appendicitis which did not so prove. I do not regret one operation. I am sorry to say I can look back on a goodly number of patients on whom I did not operate when I should and I had grave reason to regret it.

Dr. LINCOLN DAVIS, Boston: Much credit is due to Dr. Maclaren for his pioneer work in pointing out the advantages of rectal drainage in cases of appendix abscess. If we could operate on all cases of appendicitis at an early stage, there would be no need of this procedure. Unfortunately, in spite of much missionary work on the subject by surgeons, cases continue to come into our hospitals from the fourth to the tenth day of the disease, with large accumulations of pus. There is no doubt that there has been a great improvement in the mortality after operations for appendicitis in the last few years. This is due, I think, to three factors: (1) more efficient operation; the appendix is removed with less disturbance of the peritoneal cavity; (2) better drainage; the cigarette wick is certainly an advance over the old gauze pack; (3) more intelligent after-care. In the cases in which residual abscesses form after operation in spite of our best efforts to drain from above, there can be no question that rectal puncture is very definitely indicated. It is certainly safer to open such abscesses from below, rather than to poke down through the wound.

Preliminary rectal puncture, as advocated by Dr. Maclaren, has a more limited application, but still a very definite one in a small number of cases. I have not used it in just that way. I have drained two cases of appendix abscess by the rectum, without abdominal operation, with good results. The method is risky. The patient must be closely watched. There are nearly always two abscesses, one at the site of the appendix and the other in the pelvis. The drainage of one does not necessarily drain the other; therefore, after having drained the pelvic abscess, watch with the greatest care that there is no septic absorption from the original focus.

One point on which I do not fully agree with Dr. Moore is with regard to the value of Fowler's position; we use it extensively at the Massachusetts General Hospital. Postoperative rectal seepage is a life-saving procedure. Avoidance of violent catharsis is also an important matter. I have looked up all of my cases at the Massachusetts General Hospital, 249 in number. These were all acute, including general peritonitis as well. Every patient seen was operated on. Some of the cases were desperate ones. If they are sicker in the country farmhouses, they must be very sick indeed. In all but nine cases drainage was done. The appendix was removed

in all but thirteen cases, in which there was merely drainage of the abscess; in two cases by rectal puncture. There were thirteen deaths from all causes; mortality 5 per cent. plus. Secondary operations were done in ten cases; five were for drainage of residual abscesses; two by vaginal puncture, one by rectal puncture and two by incision in the flank.

THROMBOSIS AND EMBOLISM, THEIR SIGNIFICANCE AND CONSEQUENCES IN ABDOMINAL AND PELVIC SURGERY*

ANGUS McLEAN, M.D.

DETROIT

A condition which has been before the medical profession for many years, especially since the inception of modern surgery and modern surgical technic—a condition which is becoming more frequent with the ever-increasing number of abdominal and pelvic operations—a condition about which much has been written but concerning which little is known definitely, is the subject I wish to bring to the attention of this Section to-day. I refer to thrombosis and embolism.

The importance of this subject is at once apparent when we consider the great rôle played by thrombosis and embolism in raising the mortality in our surgical cases. Besides the mortality, the morbidity caused by these conditions is no small matter. Many are the cases of pulmonary, renal, and hepatic abscesses, not infrequent the cases of gangrene of extremities, necessitating amputation, that had their origin in thrombotic or embolic processes. Arteriosclerosis, a disease that in the course of time has been attributed to many different causes, is now looked on by many as originally due to embolic occlusions of many of the smaller vasa vasorum, is really the beginning of the arteriosclerosis. How does syphilis cause arteriosclerosis? The *Spirochaeta pallida*, circulating in the blood, become lodged in the smallest branches of the arteries. Their lodgment in the smallest ramifications of the vasa vasorum is really the beginning of the arteriosclerotic process. Likewise the other chronic low-grade infections often result in the same terminal process. These conditions do not, however, concern us now. In this paper I wish to consider, more especially, postoperative venous thrombosis and its probable resulting embolism.

Several etiologic factors are usually given as necessary for the formation of a thrombus: (1) trauma, especially injury to the endothelial lining; (2) stagnation or slowing of the blood-stream; (3) infection, and (4) chemical changes in the blood itself. Regarding these causes it is hardly necessary to say that not one is alone sufficient to produce a thrombus. When a thrombus does occur it is usually due to various combinations of these causes acting together. Again thrombosis often occurs, as, for instance, a femoral thrombosis that follows a surgically clean appendectomy, when, as far as we can ascertain, each one of these factors is wanting. We are therefore forced to look for some other etiologic factor in such cases. With the hope of finding some explanation for the thrombotic process in these cases, we† undertook some experiments on dogs.

* Read before the Section on Surgery at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

† Drs. R. C. Andries, W. D. Barrett and myself.

EXPERIMENTAL WORK

Experimentally, thrombosis is a difficult subject to work with, first, because of the difficulties that confront us in blood-vessel surgery generally and in the post-mortem findings in particular (as for instance locating the point of lodgment of an embolus) and, secondly, because the conditions under which thrombosis and embolus occur in the human being are difficult and practically impossible to imitate. At the outset we will say that we were unable to find any reason for their occurrence. We were, however, much impressed with the tremendous amount of injury a vein can withstand without the production of a thrombus at the site of the injury. Indeed, it is quite a difficult problem to produce a thrombus experimentally. In daily surgical work, all of us avoid injuring blood-vessels as much as possible. We always fear the possibility of causing a thrombus to develop.

In our experiments we noticed several interesting phenomena:

1. When a vein is ligated in continuity the blood in the vein will clot only on one side of the point of ligation, that is, the side from which the blood is coming.

2. In ligating a vein between two ligatures (say 2 inches apart) the blood between the ligatures clots very slowly and then only if the endothelial lining is injured, and if left for a week or more the contents of the ligated vein will have entirely disappeared, a fibrous cord-like structure alone remaining.

3. Simple crushing of a vein will not cause a clot at the point of crushing. The crushing can be repeated in forty-eight hours and a clot will not form at the site. Examination of the repeatedly crushed vein two weeks after the last crushing will show a thickening of all the coats of the vein due to an increased amount of fibrous tissue, the intima remaining as smooth and glistening as before.

4. Crushing of a vein with the subsequent introduction of a twenty-four-hour bouillon culture of staphylococci and again crushing the vein to grind (as it were) the staphylococci into the walls of the vein, will not produce a clot or thrombus at the site of the crushing and injection of the staphylococci.

5. The introduction of a sterile thread into the lumen of a vein, allowing about one half to three quarters of an inch to remain suspended inside of the vein, that is, oscillating in the blood-stream, failed to produce a clot or thrombus either at the point of the introduction of the thread or around the thread itself.

6. The introduction of a thread infected with *Staphylococcus albus* or *aureus* will in three or four days cause the formation of a thrombus at the point of the introduction of the infected thread. The thrombus becomes attached to the vein at the point where the infected thread enters. It will not entirely occlude the lumen of the vein; it will grow or enlarge in the direction of the blood-stream, remaining suspended at a single point. (See illustration.)

On examination of an induced thrombus of this kind it can readily be seen how easily such a thrombus could be torn from its small frail attachment, circulate in the blood-stream and become lodged somewhere in the pulmonary circulation and perhaps produce a fatal termination. In our experiments we were never fortunate enough to encounter such a termination. If such a thrombus did become detached in whole or in part, it lodged in a locality which had an abundance of collateral circulation and therefore passed unnoticed.

It is difficult to conceive a condition in a patient similar to the one in which we were able to produce a thrombus in the dog; but the difficulty found in producing a thrombus experimentally shows that there must be factors other than injury to the vessel, slowing of the blood-stream and infection that bring about a thrombotic process in human beings.

In necrosis, substances are produced which cause coagulation in the blood-serum which comes in contact with the necrotic tissue. Whether these substances first cause a hemolysis, a conglutination of the platelets and red corpuscles—a view usually held in regard to the method of thrombus formation—or whether these are substances akin to fibrinogen, and thus directly cause the coagulation of blood in the vessels, is not known. Is it perhaps possible that, when thrombosis occurs after a surgically clean operation, during the operation certain ligatures have been placed in such a way as entirely to cut off the blood-supply to certain areas, which subsequently become necrotic and liberate the substances necessary to complete the coagulation of blood in the surrounding vessels?

RELATION OF THROMBOSIS AND EMBOLISM TO OPERATION

In looking up the statistics we find that thrombosis and embolism follow operations for large pelvic tumors more frequently than any other operations. Of forty-eight reports of cases collected by Schenck¹ 58 per cent. followed operations for the removal of large pelvic tumors. Schenck² also shows that in 3,204 myoma operations from twelve different clinics namely, those of Goldman, Burnham, Wenczel, Duvergey, Hofmeir, Klein, Zurhelle, and Kelly, ninety-six, or 3 per cent., were followed by thrombosis. My own records of the last two years show that in 1310 laparotomies there were twenty-six cases, or about 1.9 per cent., that were followed by thrombosis or embolism. There were eight cases of fatal embolism, three cases of pulmonary embolus in which the patients recovered without further trouble, two cases of pulmonary embolus followed by lung abscess with recovery and one case of embolus of the liver followed by an hepatic abscess with recovery. Besides these cases of embolism there were twelve cases of femoral thrombosis all of which followed pelvic operations. Of the fourteen cases of embolism, eight, or 57 per cent., followed prostatectomies and hysterectomies. The striking thing in all cases of embolism and thrombosis in our series is that there was only one case of embolism with recovery and no cases at all of thrombosis that followed operations in the upper abdomen. This one case followed an operation for suppurative gall-bladder disease. In the cases that are most frequently followed by thrombosis and embolism there is always a certain amount of pressure exerted on surrounding structures. The circulation, especially the venous circulation, is retarded and extensive varicosities are quite common. There is also ample opportunity in these cases for remnants of tissue remaining, either in the form of devitalized pedicles or, as in the case of prostatectomy, shreds of connective tissue, which subsequently become necrotic and give off the substances necessary for the development of a thrombus.

Perhaps the most striking proof of the theory that necrotic tissue does cause thrombosis is presented in

1. Schenck: New York Med. Jour., Sept. 6, 1902.
2. Schenck: Tr. Am. Gynec. Soc., 1913.

those cases of pyosalpinx in which the whole fallopian tube is adherent and necrotic and can be removed entirely without ligating a single vessel. Similarly a necrotic appendix can be removed without ligating the appendiceal artery. Here ligation is not necessary because all the veins and arteries are already thrombosed from being in proximity to the necrotic tissue. The bleeding that does occur in these cases is simply an oozing from the newly formed capillaries that have developed in the adhesions.

We know that thrombosis is more apt to follow septic cases than aseptic ones. This can be readily explained. If the necrotic area is large it is difficult to imagine how it could remain free from infection even if it is an infection of such low virulence as to escape clinical detection. If therefore to the process of simple necrosis we add an infectious one, then we really have another factor for the production of a thrombus. We have an infectious condition, coincident with which there is always an inflammation and in the first stages of inflammation a slowing of the blood-stream is noticeable. If slowing of the blood-stream, inflammation and infection are at all contributory to the formation of a thrombus—and I believe they are—then the presence of all these factors, acting together with necrosis, ought to give us the greatest percentage of cases that are followed by thrombosis. This is exactly what happens clinically.

Thrombosis and its consequent embolism rarely occurs before the eighth day. The usual time is from the eighth to the twenty-first day. Recently a case came to my notice in which a fatal embolism occurred as late as two months after an operation for a uterine myoma. This is a rather slow process, but complete necrosis of the tissue, on which thrombosis to a great extent depends, is not a rapid process. It usually takes a week or ten days, about the length of time in which thrombosis usually appears. The thrombus that forms during this time may remain undisturbed almost indefinitely and again, at almost any time it may become dislodged wholly or in part, and give rise to an embolus. This explains why the time of appearance of a thrombus is earlier and more constant as compared to the late and quite inconstant appearance of an embolus.

The great majority of postoperative thromboses, except perhaps those which occur after mastoid or sinus disease—and these occur in the internal jugular vein—are found in the femoral or external iliac veins. In discussing the cause for the comparative frequency of femoral and iliac thrombosis, Clark³ came to the conclusion that it is due to the effect of traumatism exerted on the deep epigastric vein. The primary thrombosis originates in the deep epigastric vein and is slowly propagated along the line of that vessel until it reaches the external iliac vein, where it gives rise to a retrogressive thrombosis in the femoral vein. The long interval between the operation and the appearance of the femoral thrombosis suggests a slow process starting some distance away. It can be seen how a thrombus, once established in the deep epigastric vein, can be propagated to the femoral vein; but that simple trauma by retractors or the like should start a thrombotic process in the deep epigastric veins seems rather improbable, on the grounds that the most severe injury can be inflicted on veins without causing a thrombosis.

Can the formation of thrombosis and subsequent embolism be prevented? As long as we are unable to

say exactly on what factors thrombosis depends, so long shall we be unable to say definitely, whether or not we can prevent their formation. The probable causes as they present themselves to-day should of course be avoided. It is not possible to do this at all times. We cannot always avoid necrosis of tissue nor can we always avoid infections, for infections are often present before the case comes to the surgeon. In fact, they are very often the condition for which the patient seeks relief. Once a thrombus has formed, however, we can to a large extent avoid the occurrence of an embolus. The limb should be elevated to encourage the venous circulation, and kept warm, wrapped in cotton and surrounded with hot-water bags. Some advocate ligation of the vein proximal to the thrombus, but this we believe impractical in most cases and of doubtful benefit. Absolute rest must, however, be insisted on as a precaution against secondary embolism. This rest must be kept up until the clot has had a chance to become thoroughly organized, a process which will usually take from three to four weeks. If after the lapse of this time the patient is fortunate enough to have escaped the formation of a fatal pulmonary embolus from his thrombus, if he has escaped the long and tedious invalidism consequent on the lodgment of an embolus, either septic or aseptic, in his liver or elsewhere, his subjective suffering and discomfort is not at an end. Thayer⁴ examined a number of cases of postoperative venous thrombosis several years after their occurrence and found that, when the femoral and iliac veins were involved, the afflicted extremity was usually considerably and permanently enlarged. It presented varices often terminating in ulceration; in addition, there was marked weakness and cramps especially at night and on overexertion. Schenck² was able to gather the late histories (that is, four years old) of twenty-nine patients in the forty-eight cases in the Johns Hopkins series. Eight of them had symptoms for about four months and subsequently no trouble. Two had some difficulty in walking for about twelve months. Nineteen never fully recovered, being troubled with swelling and with more or less pain. On this basis he concludes that "it is fair to assume that about 65 per cent. of the patients never fully recover and that if complete restoration is to follow it will come before the end of the first year, by which time the collateral circulation is as completely established as it ever will be."

Some one has said that surgical morbidity does more to bring surgery into disrepute among the laity than surgical fatality. It is more lasting and it is continually and prominently before the people; whereas fatality is soon forgotten. If this is so, thrombosis and embolism more than any other condition should ever be in our minds as one of the possibilities that may put a practically indelible blot on even the most skilful surgery.

CONCLUSIONS

Endothelial damage, on which so much stress is usually laid, is not, *per se*, a cause of thrombosis.

Necrosis of tissue plays an important part in the production of thrombosis.

The main contributory causes are, probably, a low-grade infection, not of sufficient virulence to be noticed clinically, and slowing of the blood-stream.

308 Washington Arcade.

³ J. Clark: Univ. Penn. Med. Bull., July, 1902.

⁴ Thayer: Med. News, 1904, No. 2.

STANDARDIZATION OF SURGERY

AN ATTACK ON THE PROBLEM *

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At one time the surgeon was almost the only skilled mechanical worker with a craft knowledge analyzed, recorded and disseminated. Now the man with the shovel and the apprentice bricklayer have outstripped him in technic, for in their activities essential motions, tools, and economy of effort have been studied and standardized and taught, while we who think ourselves open-minded scientists look askance at propositions to apply to ourselves measurements of action and efficiency and fatigue, record of errors, instructions in type, motion-training, submission to discipline and new adjustments of function and cooperation. The high average of equipment, dexterity, information, conscientious care and self-sacrificing humanity in operating-rooms, great and small, here and abroad, are matters which some years of planned travel and laborious note-taking heartily attest; but evidence is not lacking that advance is very irregular where it might be all along the line, and erratic rather than on any studied and unified plan.

Is it unfair to affirm that, on the whole, surgery is unstandardized? For example, what is standard nursing? Does Germany have an idea of American ward practice in this line? What is the standard treatment of chronic non-operative disabilities? Has America shown evidence of acquaintance with the outfit of nearly every large German hospital? What is high-grade care of the well-to-do, of the poor? Has London an inkling of the provision for private patients which is a feature of our hospitals, even in small towns? On the other hand, have we any understanding of their organized insurance relief among the lower classes? In surgical teaching how many countries have copied the one that gives nation-wide promotion for merit? Indeed, to make the point we do not have to select the larger issues; elementary every-day instances will do. For the simple abdominal incision where every factor may be worked out to standard, who has run a long course of tests? In stitching and tying have we settled what are the swiftest motions, as a peasant lace-maker has; or do we ever go into training for correct form? Yet piano-players, pugilists and golfers study these things. The diamond knows every player's batting average, the race-track publishes records, the government office rates men for accomplishment. But there is no hospital governing board which, when a vacancy occurs, or the day of annual reappointment comes round, can ask for the equivalent of a fielding average, or track performance, or rating for character of work done as applied to a visiting surgeon, a house surgeon or a nurse. A consensus of opinion made up of general impressions, of personal preference and prejudice decides. Who determines, anyway, whether a man is fit to operate at all? A doctor without surgical qualification may engage bed-room and operating room in one of the dozen private sanatoriums in any large city, or in the hospital of the little community, and proceed to do the gravest of operations. Until now the patient has had no way of knowing whether or not the doctor has had surgical

training. There is no graded standard at all. That the public does not want to be protected and would hinder standardization and legislate for "medical freedom" hardly lessens the duty to lay bare the facts and to present some plan for betterment. We may first, however, get some notions of what that plan might be and set them down. For we would not like to admit the extent of our ignorance, all the way from the specific requirements as to just what is the best material for a knife-blade, or the best way to sterilize it, up to the number and kind of hospitals needed in a particular type of community.

A beginning has been made. What has been done in Germany is ably recorded in Grober's book. Our hospital superintendents have one of the most practical and effective organizations in the country. A group of independent New York hospitals is working together in several matters, such as purchasing, issuing reports, checking up of the end-results of each surgeon's work, and promotion for merit rather than for seniority. Dr. W. G. Thompson of New York has shown the unnecessary number of miles of walking done by ward nurses because of poor room planning. Philadelphia has a Committee on Hospital Efficiency named by its County Medical Society to study the whole situation there with an efficiency engineer, Mr. Richard Waterman, as its secretary. Each of the fifty-five hospitals of the city has been invited to send to a conference an "efficiency committee" made up of the superintendent, a member of the lay governing board, and a member of the professional staff. There questions of uniform accounting, cooperative social service and studies of end-results are taken up. The reports are to be had from Dr. Edward Martin, 1506 Locust Street. The New York Board of Estimate has published pamphlets covering investigations by Mr. Henry Wright concerning Bellevue and Allied Hospitals, and has recast the organization. A beginning in the coordination and standardization of dispensary work has been made for the clinics of New York (and also of Brooklyn) by the Associated Out-Patient Clinics of the City of New York, with an office at 17 West Forty-Third Street. Groups of picked men of allied interests have found that at a cost of a couple of thousand dollars within the space of five years and by a very moderate alteration or enlargement of ordinary vacations they can see the best clinics of Europe and America at work and thus select the best experience. Surgical literature is abstracted in a way more nearly approaching symmetry and completeness than ever before in the joint American-German-French publication the *International Abstract of Surgery*. Furthermore, the degree of the American College of Surgeons will set a new standard here so that the public will understand what qualifications are fundamental. And, lastly, there is a demand for the standardization of hospitals that cannot fail to bring about far-reaching results.

A GENERAL PLAN

A scheme or proposal for standardization of hospitals and surgical technic and procedure and surgical outfits would be worthy of wide and concerted effort. How should it be attacked? I have tried to find out. Dr. Hornsby answers that the organization of hospital superintendents shows that they are fully awake to the need and have made great advances on the administrative side. The father of the newer studies of efficiency in industry, Dr. Frederick W. Taylor, who

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

has praised operative work as an example of well-planned procedure, writes me as follows:

In applying the principles of scientific management to hospitals I am sure there is an immense field . . . the best progress can be made if the work is done under the guidance of a man who has had practical experience in changing over from the old to the new type of management. . . . Unless the introduction of the new methods is made the special work of a man whose whole success depends on making

statement of every single item of outfit and action. A doctor should be assigned to the engineer who would do this, taking, if necessary, two years and making Century Dictionary-sized volumes.

As to the examination of the data, it is astonishing how just the laying bare of cold facts will be enough to reform and abolish no small proportion of the things that are wrong. Most institutions boggle at the proposal to make this kind of record. They are afraid of it. Most surgeons resent it, refuse it. But this is the way to better things—to chart every break in technic, stick it up, be public about it. And cure results.

In the matter of the planning department, ask any institution for its chart. It looks foolish. It hasn't any chart. [He showed the chart of a factory organization (Chart 1) and commented on it.] This chart may be modified easily to fit the health factory. The important matter is to divide and define the functions of the various individuals, particularly of the foremen. The questions in a factory or in a hospital are these: Who? When? Where? How? Upon what man does each one of these things depend for advice and control? There would have to be some alteration to fit this class of institution. For instance, there would be no speed boss. In place of a gang boss there would be a teacher. There would be a repair man. There would be an inspector, who would be a very important part of the organization. His work would be not so much investigation as prevention. Investigation is the finding out of the cause of trouble after it happens. Inspection is the keeping of everything up to the mark so that trouble does not happen. One might be said to be post mortem, the work of the pathologist. The other might be said to be preventive medicine. This man need not be a medical man. He is the checker up and is not the man who punishes or disciplines, for when he finds something going wrong, such as a nurse dropping gauze on the floor on her way to do a dressing, or making unsafe contacts, it is he who reports to the disciplinarian. All breaks, all technical errors of whatever kind are entered by him. If a surgeon makes a fault in technic it is entered without malice and without any other idea than that of checking up. Publicity about this list of errors is the great way of stopping trouble.

The disciplinarian is the man who decides all the questions bearing on faults made. His activity is not that of bouncer in general as the word suggests. A workman may

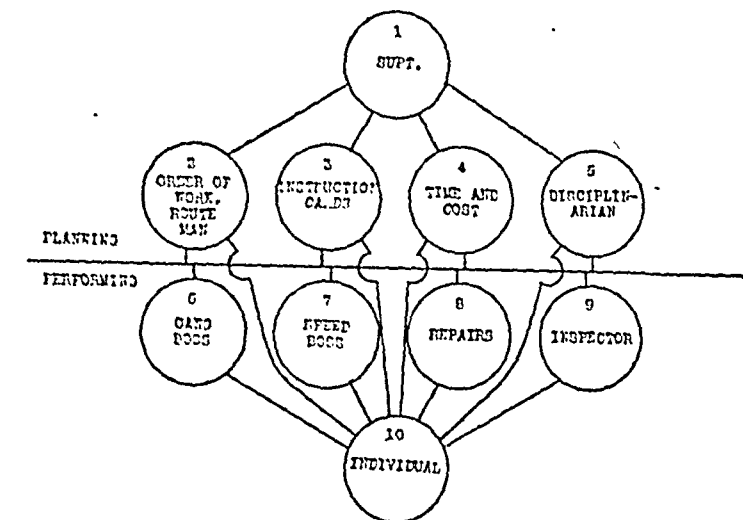


Chart 1.—Functions of scientific management, New England Butt Company, Providence, R. I., 1912.

quite rapid progress, the details are so great and the obstacles so many that even after a year or two of work, almost nothing seems to have been accomplished.

Then he gives warning that there are a multitude of fakers posing as efficiency engineers.

In Mr. Waterman's activities in Philadelphia, referred to above, an attack was made on the big problems in a basic fashion. That committee has not yet, I understand, reached the consideration of a plan of study of general surgical technic.

Mr. Frank Gilbreth, while condemning our methods rather fluently, has a program to suggest to us. He alone, as far as my questioning goes, has an answer to the query—yours and mine—What can I do—do now—to work out this thing in my own hospital, in my own line? This engineer has seen a considerable amount of operating in the United States and Canada and some in Europe. He has taken moving pictures of operations at New York Hospital, where he is consultant engineer, though he is, unhappily, too busy a man to be able to give much time to the institution. He asserts that hospitals are far behind factories in effective organization; that from 10 to 30 per cent. of precious ether moments could be saved, more especially in the period of preparation. "Surgeons," he says, "think not in terms of elementary motion, but in periods of elapsed time."

He outlined for me last February the way he would go about the study of our problems. He said:

The ideal way would be a demonstration hospital, but until one is started any institution could do these things: first, lay out a form for making a record; next, record the present practice in minutest detail; third, examine the data thus gained; fourth, organize a planning department, and last, adapt to your special needs the plan of carefully separated functions, with their functional foremen.

With regard to the study of detail, make stereoscopic pictures of everything. No detail is too small to write down. Trace the route of a pill from the manufacturer until it goes down the patient's throat. Make the most painstaking

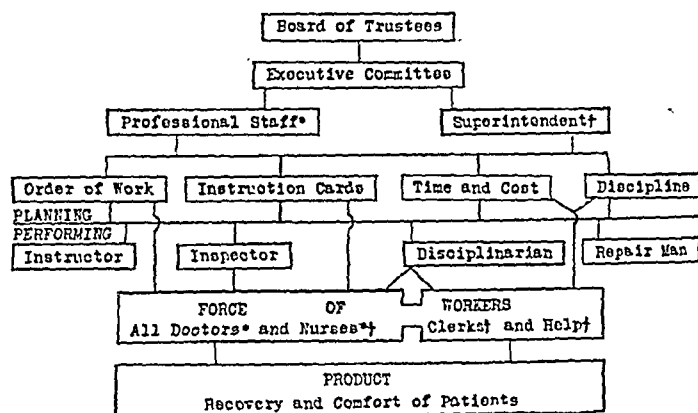


Chart 2.—Functions of scientific management in hospitals (suggested by Gilbreth, drawn by Dickinson); *—professional control; †—executive control. Alternative: Omit "Professional Staff."

commit several faults. Under the old régime it was three times and out. Then he was bounced and a new man put in who was allowed to make four errors and then he was bounced and went off and got another job. Under the new way when the first man has made errors—one, two, three—he is every time gently but persistently corrected and correction continues until he ceases to make that particular error.

As far as possible all activities are charted in a peak and valley drawing. The peaks and valleys give us the clue to the high and low points of all our work and we proceed on these clear indications.

Be simple. Use few tools. Imagine yourself operating out under a tree. Hunt out the best experience, measure it, make it standard, write it down on an instruction card. Above all get your people thinking in terms of elementary motions.

The merit of these suggestions by Mr. Gilbreth lies herein, that he gives us something concrete to start on. The medical practitioner is still trying to work on the old one-doctor-one-patient scheme. American practice in surgical services has no clear plan. It works on what might be called a one-surgeon-all-function idea. In large hospitals the usual arrangement is this: The visiting surgeon is responsible, in his wards, while on a three months' tour of duty, for many varying and ill-defined activities. He plans, teaches, inspects, executes. His ideas may vary not inconsiderably from those of his predecessor or the man who follows him, but he has neither chart nor detailed written instructions to show others what these ideas are when his trimester begins. His force is yet to be drilled. By the time it leaves him it has begun to appreciate his needs and the group is working together. Members of the house staff are frequently jealous of and openly rebellious at assistance, however skilled, given at operations by qualified older assistant visiting surgeons. Except for the one in charge, the nurses are furnished to the operating-room to be trained and are removed as soon as effective. Checking up by the visiting surgeon is sporadic, never covering all detail in the whole of his service, never overlooking an entire day's activities. Supervision of a visiting surgeon is unknown. It is not too much to say that he actually accounts in details to no one, and presents no balance sheet.

In hospitals where a surgeon's service is continuous, some system prevails. Even here, however, there is no answer to the question as to how many hours a day or a week he is required to give to this unsalaried service. Nor is tenure of office fixed. Usually it is for life. The juniors serving long years never know what prospect there is of promotion. Nor can able men not connected with the hospital determine whether opportunity or experience may be obtained in service there, as they might should a limit of fifteen years be named for such service or a Codman plan of measuring men by their results be instituted to weed out incompetents.

PLANNING DEPARTMENT

While studies looking to wide changes in organization are under way, parts of the factory scheme might be adopted, such as a planning department, instruction, inspection. As to order of work and instruction cards, rules and regulations exist in every hospital—in the back of some dusty drawer. Wherein are many dead letters and few directions for details of every-day procedure. Ward routine is tradition; a newcomer alters it at will; an enema is given in three or four ways. A house officer starting on service gets directions as to his duties passed along by word of mouth. A head nurse imported to take charge of the operating-room rarely finds these things: a schedule of duties and of outfit; formulas; a list of stock instruments as agreed on by the staff, each article catalogued by its name and picture (in a place where tools are very various); diagrams of the instrument table for each operation or class of operations, and typewritten details of the procedure adopted as the standard average in this particular set of operating-rooms. Yet every employee can be provided with a schedule of duties and belongings. In any hospital, in each of the sections of

the planning department—order of work, instruction cards, time and cost, and discipline—the study of precedents and conditions could be taken up to-morrow and in time fairly complete schemes be submitted. This could be done by one man committees or members of the professional staff combined with the executive.

INSTRUCTION

The drill of the house surgeon cannot properly take place when explanation, question and pause are impossible—with blood spurting and seconds precious. The training in aseptic operative technic of the specialist on the eye, ear, nose and throat cannot be worked out by himself, yet there is no one whose duty it is to show him. These are but examples. High or low, every one of us needs better knowledge of standards and new methods. In no rationally planned way can this be brought about save to agree on standard and to delegate the general teaching and leveling up to some qualified individual or individuals. In the training-school we are used to this daily instruction. On the professional side it is haphazard.

INSPECTION

It is not easy to adjust our point of view to the idea that the actions of all of us are to be checked up and compared with certain standards while our breaks are calmly tallied and bulletined and our results are openly scheduled. As it is at present a visiting or associate surgeon may be a striking success in diagnosis or technic but in other points like after-care or progress or humanity be grievously defective. Who may tell how the balance is to be struck under present methods?

SUMMARY

Pending the working out of a comprehensive plan we have outlined the progress already made in the direction of standards and coordination, and pointed out the way an individual surgeon or service may begin to try out certain of the advanced methods adopted in the management of industries. Some of these are new adjustments of "function" (responsibilities and duties) clarified, charted, defined; regular instruction, such as drill in technic and manual dexterity and correct form; practice in team work; the printing on instruction cards of the best standard practice covering all ordinary acts and activities; constant inspection by one delegated to this duty; record of successes and errors like a ball-player's fielding average or a government office tally of character of work done; promotion by rating, and finally, a series of studies, undertaken as in the other mechanical crafts, by measurement of motion, speed, fatigue and efficiency.

168 Clinton Street.

The Habit of Observation and Medical Education.—The one constant characteristic of all those great men who have done so much for our science is their power of accurate observation and logical deduction. . . . This habit of accurate observation is one which it is not easy to acquire. . . . But in acquiring this habit you must not be conscious of doing so, for this "self-training, self-suspicion and self-discipline" consists in absolute concentration on the work which you are doing at the moment, the cultivation of a desire for knowledge for the sake of knowledge alone, and the putting behind you of all desire to generalize or theorize without a thorough sifting of the facts. You must not constantly be looking for the practical application of the knowledge you acquire. Be content to acquire it, resting assured that the practical application will come in some form later. —B. P. Watson, *Canadian Med. Assn. Jour.*, June, 1914.

KRAEPELIN'S CONCEPTION OF PARAPHRENIA *

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INTRODUCTION

The subject of paranoia forms one of the most important chapters in the history and evolution of psychiatry. Esquirol, Lasèque, Hoffman, Snell, Westphal, Mendel, Kraepelin and a score of others helped to lay the foundation of the paranoia concept. Esquirol attempted to bring a group of cases of paranoiac conditions under the heading monomania; in 1852 Lasèque described a disease picture under the name of *delire de persecution* which was later named after him by his countrymen as *delire de Lasèque*. In 1862 and 1865 Hoffman and Snell independently of each other gave careful attention to this subject. It was not until 1878, however, that Westphal made paranoia felt and recognized in Germany; he termed it *Verücktheit* and Mendel invented the term "paranoia."

Since then the subject of paranoia has undergone many stages of transformation and variation. At one time the whole subject was in a state of confusion partly because mental diseases were incorrectly classified, partly because of deficient knowledge of the anatomy and psychology of insanity and partly due to the fact that too much stress was laid either on the symptomatologic display or etiologic foundation. It is needless to state that very little attention was paid to the disease process in all its phases, particularly in relation to the constructive development of the symptomatic picture and type of personality.

It should be borne in mind that Kraepelin in 1892 had already emphasized the fact that the paranoia group should not be looked on from the point of view of isolated symptoms, but that the whole clinical picture, including the etiology, course, duration and termination, should be considered. It was through the efforts of Kraepelin's genius and painstaking investigations that the paranoia subject assumed a more lucid scientific turn, and indeed, while the whole solution of the problem has not been completed, nevertheless our conception of paranoiac reaction types has taken a more promising view.

In the present state of our knowledge, we differentiate two large classes of paranoiac reaction types, one a paranoid symptom complex, which occurs in various toxic conditions and which may also form a part but not the dominant symptom of other types of mental disorders, for instance, a paranoid symptom may manifest itself in manic depressive insanity, hysterical psychosis, senile dementia, arteriosclerotic insanity, etc. In the other instance, the disease pictures are dominated by a paranoid symptom complex which presents various clinical manifestations in their course, such as in dementia praecox, paranoid form, paranoia, querulous paranoia and paraphrenia. The last is the subject-matter of this thesis.

GENERAL CONSIDERATIONS OF PARAPHRENIA¹

Paraphrenia forms a subgroup of endogenous dementia and in the clinical picture delusional ideas are the predominating symptoms. In some respects

it may simulate dementia praecox, but there is no characteristic disturbance of emotions and volition to such an extent as to bring about disintegration of personality. Abnormality of emotional activity, however, may be noted, but striking apathy and indifference as seen in dementia praecox are lacking, and furthermore the general conduct is influenced by abnormal thought processes and not by volitional disturbances. The etiology of paraphrenia is not definitely known and there is no specific type of heredity. It occurs in both sexes, except that the expansive form is limited to women only. The characteristic type of personality is not determined. The development is gradual; the course is progressive and the disease usually terminates in a state of psychic enfeeblement but without evidences of disintegration of personality and striking traits of emotional and volitional deterioration. Paraphrenia may be divided into four large forms: (1) systematized, (2) expansive, (3) confabulatory, and (4) fantastic.

THE TYPES OF PARAPHRENIA

1. Paraphrenia systematica is characterized by gradual development of progressive persecutory delusions and grandiose ideas, which appear in the latter part of the disease. As a rule the personality remains intact.

The onset of the disease is usually gradual—a slowly progressive change of disposition is noticed. The patient becomes quiet, reserved and dreamy. He grows secretive, seclusive and suspicious. His general conduct is odd, and occasionally he gives expression to irrational utterances. At times sensitiveness and irritability are observed. Under the least provocation he may manifest violent outbreaks and show animosity toward some persons of his environment, particularly against his relations. Not infrequently ideas of jealousy are in evidence.

In course of years the delusions of persecution become more and more marked. The patient imagines that he is being watched and followed; he expresses ideas of reference and misinterprets occurrences. He feels that people talk about him wherever he goes and thinks that detectives are sent to watch him. In fact, he feels that he is under constant observation of the police. He notices people making funny grimaces and gestures and he is the subject of trickery. In female patients sexual ideas are prominent. Likewise ideas of poisoning and delusions of being tortured are observed.

After years' duration of this painful state of suspiciousness, uncertainty and tension, actual hallucinations, particularly in the auditory field, make their appearance. The content of hallucinations varies, and inspirations and the like may occur. A feeling of influence is noted. The patient imagines he is subject to hypnotism which is employed to determine the working of his thoughts; and he believes that he is under the influence of other people's minds.

Visual, olfactory and haptic hallucinations may become manifest; women particularly experience sensations in the genital region and speak of mental sexual intercourse. Not infrequently ideas of hypnotic, magnetic and electrical influences are associated with these abnormal somatic sensations.

When in the course of many years persecutory delusions gradually and progressively become developed, ideas of grandeur set in. The latter are very rarely noticeable in the early inception of the disease or thereafter. In some instances erotic rela-

* Read before the Section on Nervous and Mental Diseases at the Sixty-fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.
1. Kraepelin: *Psychiatric*, Ed. 8, 1913, pp. 973-1022.

tions to great personages are maintained. Delusions of a religious coloring with a marked grandiose trend are seen in a small number of patients. The relationship between the delusions of persecution and the ideas of grandeur is the same as in other psychoses.

The underlying mood is mostly one of depression and apprehensiveness; the patient gradually becomes more and more suspicious, hostile and threatening. Later when delusions of grandeur develop the patient becomes self-conscious, haughty and sneering. He is seclusive and secretive, however; at times he is abrupt and inaccessible and then again he exhibits considerable politeness and is quite approachable.

The patient remains clearly oriented, and the perceptive faculty shows no impairment. Memory and retention are likewise unaffected. Falsification of memory is noted, and the patient maintains that he is persecuted since childhood and indulges in other numerous retrospective misinterpreted reminiscences.

As a rule the patient exhibits no insight into this condition, although in the early beginning of the disease he may appreciate that his situation is due to hallucinations, voices telling him that he is mentally sick, etc.

The conduct is usually influenced by the delusional content, although for some years mental adjustment may not be interrupted. Soon the disease betrays itself, however, and the patient exhibits difficulty of adapting himself to his environment. The capacity for work is retained—in fact some patients may hold responsible positions for years.

The course of this disease is insidious and gradually progressive. The condition may show some variation but to a limited degree. The disease terminates in a state of psychic infirmity with persistent delusional ideas and hallucinations but without disturbance of volition or dulling of emotions. Although the disease may last over twenty or thirty years, yet the personality remains intact.

The underlying etiology is obscure. A specific form of heredity cannot be determined. No known cause can be ascribed. A definite type of personality is not recognized by Kraepelin, though he admits that some of his patients manifested peculiar traits before the development of the psychosis. Some of his patients were sensitive, overreligious, inclined to be despondent and others were of a malicious and sadistic nature.

This form of paraphrenia occurs in both sexes: in Kraepelin's cases 60 per cent. were men and 40 per cent. women. More than 50 per cent. of cases occurred between the ages of 30 and 40; 20 per cent. of the cases developed between 40 and 50, and 25 per cent. below the age of 25 and above 50.

2. *Expansive form.* In this form of paraphrenia exalted ideas of grandeur with a preponderant elevated mood and mild excitement constitute the characteristic features of the disease picture.

The psychosis usually develops gradually, but at times a subacute onset may be observed. In 50 per cent. of Kraepelin's cases the grandiose ideas were of an erotic content. In another series of cases the delusions take a religious trend. In other instances ideas of wealth are prominent.

Almost always hallucinations make their appearance. The patients have numerous dream-like visions which as a rule are of a religious and erotic coloring and quite often they may be accompanied by auditory hallucinations; the latter, however, may also occur independently. Here illusions may play some rôle.

Hand in hand with the grandiose ideas, delusions of persecution may form a part of the clinical picture, which are not as prominent as in the other forms of paraphrenia.

The memory, orientation and perceptive faculty are not affected. However, falsification of memory not infrequently is observed.

The underlying mood is one of exaltation; the patients are self-conscious, haughty and quite boisterous. They are given to jesting and wit. At times they may become irritable, overbearing, arrogant and suspicious. Occasionally outbreaks of excitement occur.

The conduct is controlled by the morbid ideas and as a rule insight is lacking.

In the further course of the disease, the clinical picture slowly undergoes some changes. In general the patient remains clear and well-behaved; however, they adhere to their delusions which become somewhat absurd and rambling. Aside from faulty judgment there is a certain degree of dissociation, superficiality of emotional activity and weakness of will-power, but no true dementia. The personality is not distorted.

It is interesting to note that Kraepelin's cases were all women. Three-fourths of them developed between the ages of 35 and 50. In one of his cases the psychosis appeared at the age of 64, without, however, showing signs of senile dementia. Marked hereditary taint or external cause could not be determined. While no definite type of personality could be elicited, yet many of his patients manifested some peculiar traits prior to the development of the malady.

This form of paraphrenia may be mistaken for chronic mania and, indeed, some of these cases Kraepelin had previously included in the manic-depressive group. It is important to bear in mind that in the expansive form of paraphrenia, psychic enfeeblement invariably occurs; the excitement is relatively mild and without a history of previous attacks which would aid one in making a differentiation from manic depressive insanity.

3. *Confabulatory form.* In this form of paraphrenia, falsification of memory is the prominent feature in the clinical picture.

Only a limited number of cases came under Kraepelin's observation.

The development of the disease is characterized by a change in the patient's disposition. He becomes quiet; seclusive, irritable, he indulges in subtle inquiries and gradually commences to relate fantastic experiences which express themselves in delusions of persecution and ideas of reference, hallucinations and delusions of grandeur.

The delusions of persecution go back to their early childhood. For instance, the patient maintains that he was mistreated in school; that he was ridiculed by his relatives; that he was driven to masturbation; that his mother tried to poison him with an apple, and that he met people who wished to kill him; and he expresses other peculiar ideas.

The delusions of grandeur are likewise of fantastic nature and colored by falsification of memory. The patient believes himself to be a descendant from the royal family, or that he is the natural son of the king, and the like. He affirms that in school the teacher regarded him as the prince; that he was selected for the kaiser but he was too young. In such a way the patient may relate numerous fantastic grandiose adventures in the form of personal experi-

ences. Furthermore, he is capable of misinterpreting and distorting past occurrences.

The content of falsification of memory does not always limit itself to the peculiar persecutory and grandiose ideas, but it may take a retrospective trend and also find expression in the experiences the patient encounters in his daily life.

Quite often falsification of memory is associated with his immediate environment—for instance, he maintains that everything is familiar to him; imagines that he was formerly in the hospital; that nurses and patients are his old acquaintances, etc.

Sensorium is not perturbed; the patient is collected and takes cognizance of what transpires about him; gives clear and connected answers and is well-behaved. So long as his delusions do not dominate his entire personality he is clear as to his whereabouts and has good grasp on his environment.

The mood is elevated and exalted. However, transitory states of anxiety and irritability are observed. Most of the patients are loquacious and show tendency to play of words at times.

The course of the disease is progressive. "Mostly the exultant manifestations of the falsifications of memory may form a relatively short stage of the disease although the delusional fabrications continue for a longer period of time, but recurs and may possibly become more elaborated."

As time goes on the delusions become more senseless and rambling; the patient grows irritable, surly or indifferent, and finally a state of psychic enfeeblement is fully developed. As to the ultimate outcome of the clinical picture, Kraepelin cannot definitely state. Some of his cases lasted more than a decade.

This form of paraphrenia is not frequent, and Kraepelin has seen only a dozen such cases for the past thirty-five years. The two sexes may be equally affected. The disease develops between the ages of 20 and 50. No known cause could be assigned. In most cases the patient indulged in gloomy meditations long before the development of the psychosis.

4. Paraphrenia phantastica is dominated by exalted productions of marked fantastic, loosely connected, changeable delusional ideas.

Quite frequently the disease is ushered in with a depression. The patient is low spirited, dejected, anxious and expresses suicidal ideas.

Delusions of persecution gradually make their appearance. The patient imagines that he is the object of persecution, that he is under constant observation and that people talk about him. He expresses other peculiar ideas—thinks that he is to be punished for murder, larceny, etc.; imagines that he finds feces, sputum and human blood in food. Everything is drenched with arsenic, phosphorus and chloroform. Neighbors enter his room in his absence and steal clothes from him and destroy things.

Hallucinations of hearing also constitute a part of the picture. The underlying content may be threatening, persecutory, commanding, erotic or grandiose. Visual hallucinations may also occur.

Ordinary sensibility occupies an important position in the clinical picture, and on this, delusions of personal influence (*Wahn der persönlichen Beeinflussung*) are founded. The patient complains of all kinds of pains and other somatic sensations in the limbs, head and chest. He also speaks of perceiving electric shocks and receiving hypodermic injections. He imagines that his serum is electrified; that his organs

are torn out; that his voice is changed; that his whole body is transformed; that memory and his thoughts are controlled by spiritual devices, witchcraft, etc. Ideas of being hypnotized and sexual delusions are also present. Marked somatopsychic delusions of a fantastic and sexual undercurrent are often encountered—for instance, he feels that he sees men in his body—that the kaiser is in his body for the purpose of being rescued; that his father sits in his right leg; that a princess sits on his penis; that a female genital organ developed on his eye; that he consists of thirteen persons and that eight women are within him; and he expresses numerous other fantastic ideas.

In addition numerous fabrications of a fantastic nature play a rôle in the clinical picture.

Many of these delusions become cloaked in the form of falsification of memory with an underlying fantastic trend. He maintains that as a child he was robbed—that he was killed several times; that he was Christ, Eve, Moses, Alexander the Great, etc.; that he created the first people; that he studied medicine for 200 years and then again he reigned for 200 years; when he was 7 years old he ruled the world. He indulges in numerous other fabrications, etc.

The mood is slightly elevated or one of indifference. At times he may become gloomy and give vent to violent outbreaks of excitement. Irritability may also be observed, especially during longer interviews.

It is interesting to note that the patient is able to give an account of himself and answers questions to the point. His manner, however, is affected and grimaces are frequently observed. He also gives expression to senseless rhyming and play of words.

The course of the disease is progressive and gradually the utterances become confused and absurd. Neologism, very odd conduct and other eccentricities become quite marked. Emotional responses grow duller and transitory periods of violent outbreaks and irritability are of frequent occurrence. Nevertheless, many of the patients are capable of doing their work without interruption.

The rapidity of the dementia varies. In some cases it is noticeable soon after the appearance of the psychosis, within four or five years. Kraepelin knows of cases in which, aside from fantastic delusions of a peculiar confusion, he was able to demonstrate no higher grade of intellectual deterioration.

From 60 to 70 per cent. of his patients were of the male sex; on one-half of his cases the disease developed between the ages of 30 and 40, and in one-fourth below 30 and in the rest above 40. Some of his patients were of good mental endowment and of a vivacious disposition, but were inclined to indulge in subtle fancies. Others were weak-minded, stubborn and wayward. It is also interesting to note that many of his patients showed criminal propensities.

CONCLUSION

It must be admitted that the splitting up of a large heterogeneous group into subgroups with the object of restricting the disease picture to definite clinical types implies a marked advance in objective psychiatric nosology. Hence the paraphrenia group is such a welcome addition to the modern classification of mental disorders. One must bear in mind in many instances a well-defined line of demarcation between dementia praecox and paraphrenia is quite often very difficult to make; especially is this true of the confabulatory and fantastic forms. It is important to emphasize that in

the psychopathology of dementia praecox, emotional and volitional deterioration and distortion of personality stand out quite prominently, but they are only objective landmarks to aid one in establishing such differentiations. Kraepelin lays little or no stress on the type of personality in paraphrenia or other forms of psychosis, which is so much emphasized in American psychiatry, chiefly due to the painstaking efforts of Meyer and Hoch. Should it be possible to outline a characteristic type of personality and the underlying psychologic mechanisms of a paraphrenic symptom complex our knowledge of this important group would be greatly enriched.

One cannot dismiss the subject without saying a word or two regarding the differential diagnosis between paraphrenia systematica and true paranoia. It would be recalled that the former is considered a disease process inasmuch as it has a definite onset course and termination. According to Kraepelin's² present conception, however, paranoia is not a disease process, but he looks on it as a peculiar psychopathic personality—"psychic malformation." The root of this condition is sought in the peculiar paranoid anlage of the patient. The development of delusions is very slow and progressive which evolved from the personality, which at no time shows any distortion. In the clinical picture, delusions of grandeur are the foreground which result from inner conflicts and struggles, and evidently represent a fulfilment of an ungratified wish or dream.

ABSTRACT OF DISCUSSION

DR. H. DOUGLAS SINGER, Hospital, Ill.: I have studied this conception of paraphrenia by Kraepelin a good deal. I think it represents merely a way of getting out of a good many difficulties in which the system of Kraepelin's classification lands one. You will find that this particular group is composed of a number of cases which did not fit in very well in his previous classifications. Some of them represent cases which he previously classed as manic-depressive insanity with a paranoid trend. He admitted at that time that he did not know just where to place them. These have now been transferred to this group without much more justification than from that point of view. His paraphrenia phantastica represents what he called dementia paranoides in the older dementia praecox group. And this group, taken all together, really represents mental disease pictures which he has found difficult to class in any other way. He has simply put them in a separate class and attempted thereby to outline more clearly the other groups which have already been so widely accepted. I feel that all the multiplication and names and subtypes which we get in this way is a disadvantage rather than an advantage, especially when it comes to speaking of differential diagnosis between the different types. With the general conception of mental disorders which I have, in common with a good many others, I can but feel that these paraphrenic disorders again are simply individual modes of meeting situations. That in these people, who certainly present a very peculiar way of doing things, one sees a peculiar kind of personality. As Dr. Karpas says, we unquestionably will learn much more when we recognize the peculiar individual make-up which leads to these reactions. I do not feel that this represents a great advance. It is simply shelving the question of what these conditions really are and trying to maintain and define more clearly a dementia praecox disease by putting aside those cases which cannot be so clearly grouped under this conception.

DR. L. B. PILSBURY, Lincoln, Neb.: I feel as Dr. Singer does, that the newer classification has fallen into some of the faults of the old; that is, it is, as time passes, becoming more

complicated, less simple in every way, less clearly defined; in fact it is becoming top-heavy. The attempt to define more clearly is what is really bringing about this complicated situation, to be sure, but the result has been simply to befog the issue rather than to clear it up.

DR. MORRIS J. KARPAS, New York: It is true that our classification of mental disorders is incomplete and imperfect; nevertheless, an objective nosologic classification is desirable, especially from the point of view of prognostic outlook. By understanding the type of personality and the underlying psychologic mechanisms of the various psychotic manifestations, much can be accomplished toward our knowledge of diagnostic groupings. It is admitted both by the synthetic and analytic psychiatrist that classification of psychoses is indispensable for the progress of psychiatry.

THE RELATION OF PATHOLOGIC CONDITIONS IN THE NOSE AND THROAT TO THE ORIGIN AND TREATMENT OF HYPERTHYROIDISM *

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The thyroid gland prepares an internal secretion which is not limited in its action to a single mechanism, as is the case with secretin. There is much evidence to support the belief that it acts on a wide range of tissues. Prominent among the theories of its function is that of detoxication, but the mechanism of its action in this respect is not well understood. The older theories of Notkin and Blum are no longer acceptable. The metabolic activity of the tissues in a thyroidectomized animal is below *par*. There is a lowered oxygen absorption, greater tolerance for carbohydrate, a lower body temperature and a diminished activity of both physical and mental processes. The whole picture is changed by the administration of thyroid extract. Poisonous substances which might seriously affect an animal in the abnormal condition following thyroidectomy may not be so dangerous to a normal animal or to one receiving thyroid extract; not because of a direct antagonism or neutralization of the toxin by thyroid secretion, but rather because the inactive tissues of the thyroidectomized animal are less able to protect themselves.

The experiments of Perrin and Jeandelize show that a thyroidectomized animal is more susceptible to bichloride poisoning than normal animals. Frugoni and Grixoni assert that animals with experimental tuberculosis are favorably influenced by continued administration of thyroid extract. These results are to some degree confirmed by the experiments of Marbé, who found that the phagocytic function of the leukocytes and the opsonic index of the blood are distinctly lowered by thyroid removal and stimulated by thyroid administration. Numerous clinical reports show the common belief in the diminished resistance of hypothyroid subjects to the common infections, and beneficial action of thyroid administration in such cases. Sajous has advanced the hypothesis that the mechanism of the defense against infections depends to a large degree on thyroid function.

The most complete experiments showing the anti-toxic value of thyroid feeding are those of Hunt, who has found that white mice are protected from acetoni-

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

tril poisoning by thyroid administration and that there is a close quantitative relationship between the amount of thyroid given and the amount of poison to which it affords protection. The protection to toxic substances evidenced by these experiments is not a universal phenomenon, however, for other animals such as rats and guinea-pigs are rendered more susceptible to acetoneitril by thyroid administration, and mice which are protected to acetoneitril poisoning are rendered more susceptible to morphin. Such observations indicate a marked alteration in the metabolic processes of the animal rather than a mechanism of protection.

The relation of thyroid disease to previous infections has been noted clinically by many observers. In this connection it is well to remember that thyroid disturbances occur most frequently in persons of a thymicolymphatic constitution, and it is these individuals who are most susceptible to infections. The terminal event in hyperthyroid patients is not infrequently an infection which has begun in the tonsil, and I have not seen a necropsy in these instances which did not disclose the characteristic pathology of status lymphaticus. Its most common occurrence in women and its relation to the functions of the sex-glands, such as puberty, menstruation, pregnancy and lactation, are worthy of note.

A large percentage of patients with exophthalmic goiter have enlarged tonsils and adenoids. They give a history of repeated attacks of acute tonsillitis. Not infrequently one or more of the accessory sinuses are or have been infected. It is not uncommon to date the beginning of the thyroid enlargement from a particularly severe attack of tonsillar infection.

Infections in the nose and throat are undoubtedly the most common to which the human family is subject, and with that fact in mind one so disposed might build an hypothesis relating many of our ills to that forerunner. And such a conclusion would in many instances be justified for the tonsil is one of the most important ports of entry we have for infections; but in this case the resultant condition is a hyperactivity of a gland of internal secretion and not a continued infection. It is obviously more difficult to explain such a result than to trace the connection between an acute tonsillitis and a septicemia or an infected joint. An observation of much interest in this connection has been made by Halsted. In 1888 he removed a large part of the thyroid gland from normal dogs and found that the portion remaining became hyperplastic. These experiments have been widely accepted and quoted to prove a capacity for compensatory thyroid hypertrophy, but twenty-five years later, in 1913, he repeated the experiments and found that he could no longer get the same results. In the first experiments the animals' wounds were invariably infected, while in 1913 he employed careful aseptic methods and obtained primary union. Halsted does not draw the conclusion that the wound infection causes the hyperplasia, but he recognizes that such may be the case. The relation between infection and thyroid hyperplasia has further support in the experiments of de Quervain, who found that the injection of bacterial toxins caused a marked hyperplasia similar to that produced by Bircher in rats by giving them water from goitrous wells.

The theory of the origin of thyroid hyperplasia from a specific infection has been recently reviewed and developed by Gaylord in his report on carcinoma of the thyroid in salinoid fishes. In the course of

this work he studied the effects on the thyroid of rats and dogs produced by mixing with their food sediment obtained from the ponds inhabited by the goitrous fish. Such a diet produced quite remarkable thyroid hyperplasia in some of these animals; more striking, in fact, than that produced by McCarrison, who produced thyroid enlargement in goats by giving them water contaminated with the feces of goitrous men.

Infection does not in a large percentage of cases produce such an enlargement of the thyroid gland that it would be recognized as a goiter, and it may be that the thyroid does not react in this manner except in those who are not quite normal in respect to the balance of their glands of internal secretion. If the thyroid secretion is an important element in the defense against infections, it is not impossible that it is stimulated to overactivity when occasion demands, and if the stimulus be often repeated it may produce changes which we recognize as pathologic. Through the repeated stimulus to over-activity, the gland has become hypertrophied, and its heightened function continues long beyond the stimulus which called it forth. Certain experiments which I have published show beyond reasonable doubt that the discharge of iodine from the thyroid is to some degree under nerve control, but this fact does not argue against other influences working to the same end. The gastric secretion is under two influences, one nervous and the other chemical, and it is by no means unusual to find patients with a hyperactivity of the glands secreting the hydrochloric acid of the gastric juice.

Clinically there is an important relation between the infections in the nose and throat and hyperthyroidism. In patients between the ages of 16 and 24, from 35 to 40 per cent. give a history of repeated attacks of acute tonsillitis, and many of them have a chronic pharyngitis and rhinitis with enlarged tonsils and adenoids. Not infrequently one or more of the accessory sinuses is infected. It is by no means a rare thing to find that a rapid enlargement of the thyroid with characteristic symptoms of overactivity has followed immediately after a particularly severe tonsillar infection. Such patients bear these infections badly. Their convalescence is slow and each attack is accompanied by severe prostrations quite out of proportion to the seeming severity of the infection. It has been my observation that the leukocytosis accompanying these infections is lower than usually found in similar conditions in non-goitrous patients, and, although they may have the local condition characteristic of quinsy, they do not usually form an abscess which gives free pus when opened. Hyperthyroid patients often show a marked leukopenia with a relative lymphocytosis indicating some influence on the blood-picture, and this influence is evidently operative when the organism is subjected to infection.

There is no complicating factor in exophthalmic goiter which is more troublesome or more dangerous to the patient than the tonsil infections to which they are subject. Every effort should be made to prevent them. When the patient's general condition will permit, the tonsils should be enucleated and the adenoids removed. But such an operation should not be done on a patient suffering from an active thyroid intoxication without appreciation that such patients do not stand operation of any sort well, and all precaution should be taken to prevent shock from the ordeal. The methods followed by Crile in stealing the thyroid

apply quite as forcibly to operative procedure of every sort on these patients. It has not infrequently happened that the surgeon has been surprised by the unusual reaction following tonsillectomy and has found on closer examination that his patient had an enlarged thyroid with most of the symptoms of hyperthyroidism. Such an observation should precede and not follow the operation. The relief which follows the elimination of infection, whether in the sinuses, the nasopharynx or tonsil, is usually so prompt and effective that one has little doubt as to its causal relation to the overactive thyroid, and it becomes at times more important to attend to the infected areas than to attempt direct action on the thyroid. By so doing many patients will be permitted to retain their glands for a useful function.

Every young patient with an enlarged thyroid should have a careful examination of the nose and throat, and the converse is equally true. Between the ages of 12 and 20 is the beginning point of most thyroid enlargements, and it has been my observation that a combination of enlarged chronically infected tonsils and adenoids, gastro-intestinal disorders accompanied by constipation, and an enlarged thyroid with mild nervous and heart symptoms is the beginning of a condition which usually does not attract much attention unless the patient (and these individuals are nearly always young women) is annoyed by the cosmetic defect in the neck. This is the physical foundation to which such girls bring the exacting demands of school, college and social life, and under its strain a large percentage of them sooner or later fall as victims. Hyperthyroidism can be checked in such patients before any serious damage is done if the beginning is recognized. It is unfortunate that the facility with which the thyroid gland can be removed has led to many needless operations in the type of patient described.

The beginning of thyroid disease should receive more attention. Too frequently it is overlooked, and when discovered is taken lightly except in the face of quite disturbing symptoms. The progress of preventive medicine will ultimately lead to the discovery of most of these beginning cases at a time when they are easily curable with preservation of the integrity of the thyroid. Medical inspection in school and college should accomplish a great deal more in this respect than it now does.

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ABSTRACT OF DISCUSSION

DR. CHARLES G. JENNINGS, Detroit: One word concerning the question of diagnosis; what symptoms will put the examiner on the track of thyroid toxemia? So far as my experience goes, there are two symptoms of the greatest value, which are easily elicited by the usual examination. They are the debility and the tremor. Both may be mild but are almost uniformly present. The question of therapeutics is largely hygienic. Rest is perhaps the most important. Girls in early adolescence, in boarding schools particularly, suffer from a mild type of the trouble and they must be given rest; social, intellectual and physical rest. The wear and tear of social functions often bring about this condition. As to medicinal treatment, my experience is that in these cases, in spite of the fact that they are cases of hyperthyroidism, the patients do well on a thyroid preparation, administered over a long period in small doses. I am in the habit of using the preparation produced by Dr. Beebe in the Cornell Laboratory. Many of these cases respond well to this remedy, combined with rest and symptomatic treatment.

Occasionally quinin hydrobromid can be alternated with the thyroid preparation. There is nothing special in the diet so far as I can see, except a diet that will relieve digestive embarrassment, if that be present. Occasionally ferrous iodid seems to be valuable. Some recently published observations by Wilson and Plummer of Rochester show that this type we so frequently see is a distinct pathologic and clinical entity. Wilson calls them toxic non-exophthalmic goiter and the changes in the gland as observed by him are not those of true exophthalmic goiter. They do not develop the eye symptoms. Such cases go for ten or fifteen years with symptoms of hyperthyroidism and yet never develop characteristic exophthalmic goiter. The pathologic changes are hyperplasia, regeneration, and the formation of connective tissue, and of course this gives rise to perverted secretion. The physiologists ought to be able to help us considerably in this study.

DR. OTTO JOACHIM, New Orleans: Twenty-five years ago Fraenkel called attention in a clinical case to the reduction of goiter on the same side as that on which he reduced a hyperplastic inferior turbinate. This was looked on at that time as a very extraordinary result and not held in any causal relation. The idea was not followed up. We should be very grateful to Dr. Beebe for calling our attention more specifically to the pathologic condition following infections of the nose and throat. More strongly than ever, the theory of disturbed internal secretions advanced yesterday by Dr. Beck appeals to me. We need not look necessarily for a focus of a purulent type to explain these disturbances. A great many will be accounted for on the ground of disturbed defective or overactive internal secretions which in turn affect the thyroid.

In our part of the country we see a great deal of thyroid trouble, especially in young people, and we are often confronted with the necessity of relieving these patients without operation. I am also of the opinion that, in the earlier stages, these cases are amenable to therapeutic measures. Operation is not always indicated and the diagnosis of the beginning of the trouble is of extreme importance. The importance of these relations between abnormal conditions of the nose and throat and hyperthyroidism, however, are such that we need thorough laboratory investigations to clear up the matter. Of course, as laryngologists, we are not necessarily competent and have not always the opportunity to properly study these cases. They come to us and then disappear from our observation. The final light must come from the internist who has a better opportunity for this study.

DR. GEORGE E. SHAMBAUGH, Chicago: Dr. Beebe brings out the importance of the specialist cooperating with the internist. I emphasize this because there has been too great a tendency toward the development of special hospitals, where the eye, ear, nose and throat specialist does his work isolated from close association with other fields of medicine. The few advantages in this arrangement are far outweighed by the much greater disadvantages arising through the lack of cooperation with other branches of medicine. The best arrangement, and the one in which our best work is done, is in a general hospital, where our work is carried out in cooperation with the internist, the neurologist, the general surgeon, the dentist, etc. In the Presbyterian Hospital, in Chicago, we have been interested in this relation between hyperthyroidism and the faucial tonsils. I have several times been requested by the internist to remove the tonsil in these cases, and when asked to operate in such cases, I do so, nor do I attempt to hunt over the tonsil for palpable evidence of foci of infection before consenting to carry out the internist's request. The possibility of abnormal tonsils being the focus for the changes in the thyroid is interesting. I have several times seen the disappearance of the hyperthyroidism in a remarkably short time after the removal of the faucial tonsils. It has been suggested that the relation may be reversed. If so I do not see why the goiter should disappear after the removal of the tonsils.

DR. JOHN F. BARNHILL, Indianapolis: This subject is entirely too new to have data that is worth while. It is only in the past two years that we have been adding to our case

records, or at least that I have, the condition of each thyroid at the time of making the throat examination. Dr. Shurly recently, before the American Laryngological Society, expressed the belief that there is a relationship between hyperthyroidism, and tonsil and throat infections. Knowing that we were to have Dr. Beebe's paper, on my return home from this meeting of the Laryngological Society I looked up as many of the cases of hyperthyroidism in which I had operated for removal of the tonsils, as I could find. I found seven cases in which in the last three years I had removed the tonsils when this condition existed. In none of these cases, so far as I was able to judge, was the thyroid condition improved. One of these patients had been operated on in one of the large clinics for hyperthyroidism two years previously. The surgeon who did the operation had stated that the patient had enlarged tonsils which ought to be removed at once. When she had fully recovered from the thyroid operation I removed the tonsils. She was improved for a time. I saw this patient three days ago and the lobe of the thyroid opposite to the one which had been removed is now enlarged and she has very marked exophthalmos. This was interesting to me because one lobe of the thyroid had been removed and the tonsils had been removed, and yet she still has the condition of hyperthyroidism. I believe that there is a connection between tonsillar infection and hyperthyroidism in the same way, perhaps, as an infected toe or antrum or gall-bladder might bring about such conditions; that is, by lowering bodily resistance. It is our duty, therefore, to discover these cases early, because I am convinced from examination of the cases that I have recently made, that whatever benefit we are to get from removal of the tonsils must come from operating in an early stage of the thyroid enlargement.

DR. JOSEPH C. BECK, Chicago: The subject of the infections of the upper respiratory tract in connection with thyroid disease has interested me for some time and I am in a position to speak from experience on the subject in its entirety, for I follow these cases whenever hyperthyroidism is present. Dr. Barnhill said exactly what I would say with reference to the curing of any patient with hyperthyroidism by removal of the tonsils and I have had quite an experience in that line. I have seldom seen a case that did not respond by improvement, nor have I seen a single case that was difficult to operate on. One certainly would not attempt to do a tonsillectomy in a patient in a down-grade stage of hyperthyroidism. Tonsillectomy will do this; it will do what a single ligation of the superior thyroid artery will do; it is transitory. It puts the patient in a condition in which a thyroidectomy may be done. My statement concerning the tonsils as causing hyperthyroidism is based on a study of the sympathetic nervous system. It is believed that toxic elements, not necessarily pyogenic, either stimulate or depress the vagus and alternately the sympathetic and produce changes in the internal secretions. The pathologic changes in the thyroid itself, of course, we understand, the colloid changes, which are degenerative, and have nothing to do with an infective process.

DR. GEORGE F. COTT, Buffalo: My experience has been similar to that of Drs. Beck and Barnhill. I have operated on children of 10, 15 and 20 years of age and people as old as 69, and not a single one of these patients, thirty in number, have had any throat complaint or tonsillar or sinus trouble. So that I have reason to believe that the condition was not due to any infection of the upper respiratory tract. Dr. Beck told us what we may expect from disturbances of the internal secretions and, of course, these infections may cause disturbance of the internal secretions, but that may happen in other diseases as well as in goiter. Of all the patients I have operated on for goiter, not one complained of trouble with the throat or nose at any time. I want to make this statement from the point of view of a laryngologist as compared with that of Drs. Beebe and Jennings, and I think we have as much chance of observing these conditions as has the internist.

DR. OWEN SMITH, Portland, Maine: For fifteen years I have been interested in this particular line of work. The

question of diagnosis in these cases is particularly important to the laryngologist because a great many of them come to him before the symptoms become so pronounced as to attract the attention of the internist. In small cities the laryngologists are supposed to be better qualified to handle these cases than a great many of the so-called general practitioners, and they should not only be able to cooperate with the internist, but should be qualified to handle these cases both from a medical and surgical point of view.

A discouraging feature, from my observation, is that it is difficult to decide from the work of the internist and the surgeon just what is best to do in these cases; whether to treat them medically or to go on to the more radical surgical procedures. The medical treatment, in my experience, has been rather disappointing. I have followed, more or less, the work of Dr. Beebe and Dr. Forscheimer. The latter basing his work, perhaps, on the septic theory, has attained better results than in any other method of medical treatment. On the other hand, the radical surgical treatment at times is very disappointing, although sometimes the results are striking, the patient recovering rapidly.

DR. HENRY HORN, San Francisco: The propaganda of education which Dr. Beebe has presented is at this time very apropos. We, as laryngologists, possess a field of investigation which up to this time, so far as I know, has not been worked up, and inasmuch as the object of these meetings is to draw the general surgeon, the laryngologist and the internist into closer contact with our work, I desire to call attention to a problem which perhaps has not been sufficiently considered: the possibility of the tonsil as an organ of internal secretion. As specialists who remove hundreds of tonsils, we are possibly in a position to draw conclusions better than any one else, but, nevertheless, in the thousands that are removed, the opportunities for observation are seldom carried out in any systematic way. I only wish to call attention to the fact that there is a certain class of cases, especially in young women, in which removal of the tonsils will produce a condition closely related to what we know as the thyroid symptom-complex; tachycardia, intense nervousness, etc. Now, of course, that suggestion is immediately open to the objection that these cases may be cases of hyperthyroidism; I do not think so, and I think we should observe some of these cases and study them more closely with the internist.

DR. BURT R. SHURLY, Detroit: I have been much interested in this subject for five or ten years and I think there are certain points that we are very liable to neglect. Certain essential facts are necessary to be known, for in the equipment of the laryngologist certain facts of diagnosis in internal medicine are particularly valuable to us, if we can have classified knowledge and definite ideas of just exactly how we are to consider some of these problems that really belong to internal medicine and yet in which we have a great interest. In this way our equipment as laryngologists will certainly be very much improved. The great essential, it seems to me, is that we should consider an examination of the thyroid gland as part of our routine procedure in every case. A great many men will overlook the thyroid gland entirely, while if we will examine it anything of particular significance may be immediately followed up with further investigation. Dr. Beebe and Dr. Rogers of New York have certainly been the pioneers in developing this subject, and they have given us the greater part of our knowledge in this regard. Dr. Rogers has a fine history scheme which immediately concentrates one's investigation of the symptoms of thyroid trouble as it may be connected with any condition of the throat or nose. It is not claimed that diseased tonsils are the only cause of goiter. We all know that hyperthyroidism is very frequently associated with nervous shock, overwork, miscarriages and postobstetric conditions. As Dr. Jennings has said, in Michigan we have a considerable number of mild cases, and many of these are overlooked. It seems to me the prophylactic effect of removing the tonsils is quite effective. If you can prevent recurrent tonsillitis you prevent the acute condition again and it is the acute condition that makes the trouble.

Will Dr. Jennings say something of the essentials of medical treatment?

DR. S. P. BEEBE, New York: It was not my purpose to advocate the removal of tonsils and adenoids as a cure for exophthalmic goiter. If any one has so understood my statement, I wish to correct it. What I have said about the frequent occurrence of infected areas in the nose and throat is derived from the history of approximately 3,500 patients who have had this disease. It is quite possible for one to have had a number of patients with thyroid disease who have not at the same time had either sinus or throat infections. Nevertheless such infections are a most common accompaniment of thyroid disease, and, in my judgment, constitute an important factor in maintaining a condition which favors overactivity of the thyroid gland. One cannot see the effect of repeated infections in these patients without being impressed with their importance. I wish, however, to impress the importance of making every effort to discover the beginning of thyroid disease. As specialists you will frequently be consulted by parents who bring their children to you for nose and throat infections. The patient may not have been seen by an internist at any time and, unless the physician who does see them examines the patient with reference to his general condition, as well as to determine the condition of the nose and throat, many diagnoses that might be made will be missed. Routine examinations of the nose and throat should include an examination for any possible enlargement of the thyroid gland. Simple tonsillectomy or removal of adenoids is not all that is necessary to do in the line of treatment even in these early cases, but the custom of regarding a thyroid enlargement as of little medical importance unless accompanied by marked or severe symptoms is an error too commonly made at present. When the thyroid disease is well developed and the gland itself has undergone a marked pathologic change, there is no reason to suppose that a cure will be obtained simply by attention to the nose and throat infections. A recurrence of thyroid disease after repairing the nose and throat does not controvert the necessity for attention to such a condition. The most important thing in this work is to prevent the serious thyroid disease which has insidious beginnings, and these patients so often come to the nose and throat specialists first that it is of decided importance that the beginnings of thyroid disease should not be overlooked at a time when the patient's recovery is a comparatively simple matter.

THE USE OF CELLULOID SPLINTS IN THE TREATMENT OF DISEASES OF THE NERVOUS SYSTEM *

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In the treatment of diseases of the nervous system as in the treatment of other diseases, the attending physician must measure the success of his treatment by the preservation of the life of the patient and the restoration of function in the anatomic structures diseased.

Of those diseases which endanger life and disable the patient by paralyzing muscles, groups of muscles and entire members, poliomyelitis stands as the most common type. During the acute stage of this disease the patient should rest in bed, the nares should be washed with a 1 per cent. solution of hydrogen peroxid, hexamethylenamin administered, and the pains controlled by the application of heat or by the giving of analgesics, if needed, and lumbar puncture done if there be signs of meningeal irritation.

After the acute stage is passed the physician must interest himself in and direct his treatment toward the restoration of muscular function and the prevention of deformities. The restoration of muscular function can be encouraged and facilitated by massage, electricity and exercise. The paralyzed muscles should be tested with the faradic current and if they respond to faradic stimulation two weeks after the onset of the paralysis, recovery should be expected. If they do not so respond, recovery may take place if the proper treatment be instituted. The electric current which gives the best therapeutic results is the galvanic. It is the characteristic tendency of poliomyelitis to paralyze individual muscles and groups of muscles, and it is for this reason that deformities are so prone to occur.

The prevention of deformities is the most important part of the after-treatment of poliomyelitis. They occur with great frequency, and are to a much greater degree responsible for the permanent disabilities of the patient than are the paralyzes. In but a small percentage of patients is the paralysis so extensive and disabling in character as permanently to prevent walking, but the deformities so cripple a large percentage of patients that walking is very difficult or impossible. General acceptance is given to the idea that paralyzed muscles should be placed and fixed in the position of rest, should not be overstretched by the action of non-paralyzed antagonistic muscles, and should be supported in order that they may be used as their condition will permit.

Numerous and various methods have been suggested by which rest, relaxation and protection of the paralyzed muscles can be secured. Simple rest in bed is considered adequate by some, others apply a splint so as to fix the limb in normal position, while others splint the limb so that the paralyzed muscles are completely relaxed and the antagonistic muscles are hyperstretched. I do not presume to say that any of these methods are bad, either absolutely or relatively. Any one of the three methods can perhaps be applied with success to individual cases.

It is my opinion that all limbs paralyzed by poliomyelitis should be fixed in the normal position of rest, so that the paralyzed muscles cannot be overstretched, and held in such position by a splint which gives sufficient support to enable the patient to walk during the stage of repair, thus applying a physiologic stimulus to aid the recovery of the affected muscles.

Contractures begin to develop early in poliomyelitis and protection should be given to the paralyzed muscles from the onset. The most common of the early deformities is toe-drop, occurring as a result of the contraction of the flexors of the toes and of the extensors of the foot, in the absence of the action of the opposing muscles. As this deformity is hastened by the weight of the bedclothes a cradle should be used when it is expected.

As soon as the pain has subsided sufficiently to enable the paralyzed structures to be handled without occasioning too much discomfort, a splint should be applied for the reasons given above.

As a material for the making of such splints I believe celluloid has many advantages. Celluloid splints are simple, effective and cheap, and most successfully meet all requirements. They keep the muscles at rest in a position of relaxation, prevent deformities and enable the patient to walk while repair is progressing. They can be worn both day and night with

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entire comfort, do not absorb moisture, are sufficiently strong to support an adult, and yet are very light—those for a child weighing from 10 to 14 ounces and those for an adult from 24 to 32 ounces—are readily removed in order that the limb may be washed, massaged or treated with electricity and can be reapplied without difficulty. In more than 85 per cent. of the cases the muscles of one or both legs are affected, but in about 40 per cent. they are affected in combination with the muscles of the trunk, arms and neck. In 15 per cent. of the cases the legs are not affected, but the celluloid splints can be applied to the arms, trunk or neck and perform the same functions as when applied to the legs.

CLASS OF CASES SUITABLE FOR SPLINTING

All cases of paralysis of the legs are suitable for splinting, except those with complete loss of power in the psoas and iliacus group and in the glutei. Those cases in which the back, lumbar and abdominal muscles are much affected are also unsuitable for splinting, but if there be considerable affection of the dorsal and abdominal muscles with little involvement of the legs, a spinal jacket is very helpful. The extent of the splint must vary according to the degree of the paralysis. If the leg be extensively paralyzed, the splint should encompass the entire leg as high as the tuber ischii behind, the trochanter on the outer side and the ramus of the pubes on the inner side. If the paralysis be limited to the muscles below the knee a splint reaching to the knee will suffice.

Celluloid splints have been found most useful in the treatment of the paralyzes and in the prevention of the deformities of poliomyelitis, but they have a much wider range of usefulness. They are of benefit in the treatment of the wrist-drop or toe-drop associated with lead or alcoholic neuritis, or that from any other cause. They are also of value in the treatment of hemiplegia, with contraction and inversion of the foot, and in contracted conditions of the hand. They will prevent deformities if applied early in the diplegias of infancy and in myelitis.

The celluloid splint is of much value in the treatment of some conditions occurring in tabes, in hypotonia with hyperextension of the knee, they support the knees and enable the patient to walk. In Charcot's disease of the knee-joint they give support, so that the patient can walk without the danger of the knee suddenly giving way, and the fixation with pressure limits the extension of the disease and the effusion which often takes place within and around the joint. In order that the best results may be obtained the patient with Charcot's disease should rest in bed for several days before the cast for the knee is taken, so that the edema and swelling of the joint may subside, otherwise the splint will shortly be too large.

We are indebted to Calot¹ of Berck-sur-Mer for using and bringing celluloid splints to the attention of the profession. Gauvain² introduced them into England and used them in the treatment of tuberculous joints. To him belongs the credit of much of the improved technic in making them. Dr. Frederick Batten³ of the National Hospital for the Paralyzed and Epileptic, and of the Great Ormond Street Hospital for Sick Children, London, proved their great value in the treatment of poliomyelitis and other diseases of the nervous

system. Dr. Batten, relative to his experience with them, says⁴: "I have used them frequently during the past two years in the treatment of cases of poliomyelitis, and they have proved of the greatest service in preventing deformity and hastening recovery."

MAKING THE SPLINTS

The following processes are involved in making the splints:

1. The taking of the negative cast of the part to be splinted.
2. The making of the positive cast from the negative.
3. The building of the splint on the positive cast.

The details of these three processes are to be given, but I desire to emphasize the importance of the first process. The negative cast should be applied by the physician and it is essential that it be made properly, otherwise it will be useless.

THE NEGATIVE CAST

For the purpose of making the negative cast the following articles are required: a strip of lead $\frac{3}{4}$ inch wide and 2 or 3 feet in length, some oil, a strong knife with a sharp point, and some plaster-of-Paris bandages. For this purpose the ordinary surgical bandages are really not suitable. Batten recommends a bandage made of book-muslin, $4\frac{1}{2}$ inches wide and from 4 to 6 yards in length, loosely wound and not too heavily loaded with plaster.

The part of the body of which the cast is required is first shaved, if hairy, and then oiled. The strip of lead is oiled and adjusted to the point at which the cast is to be opened. The limb is now placed and held in the position in which it is to be fixed by the splint. As stated above, one of the most important functions performed by a splint to a disabled leg is to enable the patient to walk during the process of repair. If the leg be splinted with the knee hyperextended and the foot dorsiflexed on the tibia, walking will not be possible. The knee should be slightly flexed and the foot held exactly at right angle with the tibia. The plaster-of-Paris bandages are placed in warm water and after being squeezed out are wound round the limb, starting at the periphery and working up. The best results will be obtained if each bandage is taken continuously from one extremity of the cast to the other. If this be done the tendency of the cast to crack transversely will be much lessened. It is not necessary that the cast be very thick; four or five bandages for the entire leg of a child from 6 to 8 years old will be ample. The plaster will usually set in from three to five minutes. After it has set sufficiently a cut is made down to the lead. Before manipulating the cast be sure that all threads are divided, or a portion of the cast may be pulled out of place and the cast spoiled. The cut edges of the cast are now separated and the lead removed through the incision; the edges are still further separated and the cast is gently removed from the limb. In the case of the leg, if an assistant will grasp the toes and pull them forward while the cast is pushed backward little difficulty will be experienced.

After the removal of the cast the cut edges are carefully approximated and a single layer of plaster bandage wound round the cast from one end to the other, the lower opening being carefully closed with the bandage. This completes the negative cast and it is laid away to dry.

1. Calot: *Orthopédie Indispensable*, Paris, 1913.
2. Gauvain: *Brit. Med. Jour.*, 1913, i, 1200.
3. Batten, Frederick: *Lancet*, London, 1912, i, 80.

4. Batten, Frederick: *Clin. Jour.*, 1913, xlii, 5.

THE POSITIVE CAST

The time required for the negative cast to dry is from twelve to twenty-four hours; after it has thoroughly dried the positive cast may be made. The inner side of the negative cast is well oiled; a bamboo cane or small stick of wood of adequate strength to support the positive cast and several inches longer than the negative cast is placed down the center. The plaster-of-Paris is now mixed in the usual manner, poured into the cast and allowed to stand for about twelve hours. An incision is made through the single layer of plaster bandage, the cut edges of the negative cast separated and the positive cast removed. The positive cast is now ready for the molding of the splint.

THE MOLDING OF THE SPLINT ON THE POSITIVE CAST

As previously stated, to build the splint on the positive cast is not a difficult process and may be done equally well by the physician or nurse. The various articles required are as follows: stockinet or thin felt, gauze or book-muslin, solution of celluloid in acetone ("Gauvain's solution"—11 ounces of celluloid to 160 ounces of acetone, to which is added 3 ounces of calcium chlorid dissolved in 2 ounces of hot water, which should be added to the celluloid solution while still hot and well shaken), celluloid varnish (cellulose triacetate one part, acetone five parts), some leather for binding the splint and some boot-hooks.

METHOD

A layer of stockinet or felt is sewn over the positive cast. Over this is placed a layer of gauze or book-muslin, so cut as to conform to the shape of the cast. On this is painted a coat of the celluloid solution; another layer of gauze is applied, on which is painted another coat of celluloid solution; this process is repeated until from twelve to eighteen coats of celluloid solution are painted on as many layers of gauze, the number varying with the age of the patient and the character of the part to be splinted. Sufficient time should be allowed between the application of the successive coats of celluloid for the previous coat to dry. A few extra layers should be applied about the knee and ankle. After the final coat has dried a layer of celluloid varnish is applied. Two incisions are now made about $\frac{1}{2}$ inch apart and a strip of the splint removed at the point at which the opening is to be made. This permits of the removal of the positive cast from the interior of the splint. The splint is now ready to be fitted to the patient. It should fit perfectly, assuming that the cast was well made. It is usually necessary to cut away a small amount of the splint around the knee and ankle in order to facilitate its removal and reapplication.

After the fitting process is completed, the edges of the splint are bound with leather and boot-hooks are inserted. It is now ready for wear. The splint should be worn next to the skin as a stocking inside will force it out of place. It should be applied while the patient is still in bed, laced on and worn day and night, being removed twice a day for massage and passive movements. If it causes discomfort by undue pressure at any point, it should be stretched and manipulated so as to relieve the pressure. If relief cannot be obtained in this manner, some of the splint should be cut away rather than to put wool or leather inside the splint to relieve the pressure.

It is desirable that the patient be up and walking as soon as possible after the onset of the disease. Aided by the splints the average patient can walk at the end of the first month, without liability to deformity. A walking apparatus is usually necessary at first but many patients regain strength so rapidly that they are soon able to walk alone. A slipper or shoe should be fitted and worn over the splint, as walking is thereby made easier. Some patients with poliomyelitis recover so rapidly that the splints are no longer needed after a few months, while others may need to wear them even up to two years. If walking is not possible without support at the end of this time, a metal brace should be applied when the splints are discarded. In some cases of this disease there is never sufficient restoration to enable the patient to walk without some support. In those cases a metal brace will answer better after the splints have served their purpose.

CONCLUSIONS

Many patients with poliomyelitis are permanently disabled because of deformities. Celluloid splints prevent the deformities and aid in the recovery of the paralyzed muscles. They render the same aid in many other forms of paralysis and by affording support they give much comfort and greatly increase the efficiency of the patient with a Charcot joint and in extreme cases of hypotonia of tabes.

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ANAPHYLAXIS FOLLOWING SKIN-GRAFTING FOR BURNS

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The case herewith reported is of interest, partly because perfect recovery followed, notwithstanding the extent of the burn and its systemic effects, and partly for the occurrence of certain phenomena analogous to if not identical with anaphylaxis. To quote Auer,¹ "While the investigator should be alert to note resemblances of reaction in the different species, he should be still more alert to discover new types of reaction." So far as I am aware there has been no effort to identify the reaction accompanying repeated skin-grafting over large areas with that of anaphylaxis, yet it seems clear that they are closely related if not identical, as the following case indicates:

History.—G. H., man, aged 25, driver, gave no evidence or history of constitutional disease of any kind. On the night of Nov. 14, 1910, he was burned by the explosion of a kerosene lamp. When seen by me shortly after the accident he was suffering acutely and presented burns from head to the knees with the charred night-clothes adherent to the flesh. The areas burned were: face, scorched but not blistered; neck, blistered and skin above right clavicle destroyed over an area of several square inches; right shoulder burned to third degree; right arm burned to third degree over two thirds its surface; right forearm burned to a blister; both hands badly blistered; all the right side and nearly half of the left side of the thorax burned badly, nearly all to third degree; about one-third of the entire back blistered, about one-third to the third degree; abdomen and groin on the right side burned to third degree, on left side, scorched; right hip blistered; right thigh, third degree burn over its inner aspect; external genitals completely blistered; left thigh, third degree burn over one-fourth inner surface; extensive areas burned to

1. Auer, J., in Forchheimer's *Therapeutics*, v.

large blisters over both thighs; knees, legs and feet free. I estimated that fully half of the surface of the body was affected.

Treatment.—Temporary dressings with moist compresses of sodium bicarbonate were applied and an opiate given. Next day Nietzsche's oil varnish was applied: lead oxid 1 part, linseed oil (boiled) 25 parts, salicylic acid 5 parts. The diet, for one month, was restricted to fluids. High rectal enemas were given once or twice daily. Digitalis and strychnin were given when the pulse indicated it. Skin-grafting was begun as early as the local condition warranted, skin being employed from the patient's brother, and later from friends and neighbors. In all grafting was done at twenty-two sittings and skin was furnished by seventeen different persons. The dates of the earlier grafts are as follows: November 26, 30, December 5, 9, 10, 11, 12, 13, 14, 15, 17. These earlier grafts took readily and thrived but just about the last date mentioned trouble began. An area about 6 inches square was grafted and did not take; then some of the old grafts began to "melt." Succeeding grafts also failed. Over a large area of the left thigh and back where no grafting had been done but autogenous epitheliation had progressed well, the tissue "mushed" and oozed blood badly. Hematuria appeared and lasted two days, and the heart impulse became irregular and weak. An examination of the blood, stained with eosin and methylene blue, showed distinct purplish granules in the red cells in enormous numbers. No blood-count was made, but there appeared to be a diminution per field in the white cells.

Having in mind some previous experiences with surgical wounds reopening coincidently with malarial attacks, I administered quinin for a few days although I could elicit no history of malaria. The patient's temperature rose irregularly in spite of rectal irrigations and laxatives till it reached 102, and 103 F. Pulse was 100 and regular.

Urine examination was negative for pus and albumin. Once or twice soon after the blood disappeared from the urine, the cold nitric acid test elicited the secondary ring, which disappeared on warming.

Egg grafts were next tried (December 24), and at first took well. The first was applied to the groin, and scarlet red used to stimulate a take. This I used in 8 per cent. ointment with boric acid or dusted in pure powder on the grafts and wound margins with the best results throughout the remainder of the case, and I attribute the good result attained partly to its use.

Egg grafts were repeated December 27, 28 and 31, January 2 (when the temperature rose to 100.3) and also January 7, 9 and 15. January 23 I ventured again to use a human graft, this from the patient's sister. A temporary take occurred but did not thrive well enough to offer much encouragement. The only human graft which thrived thereafter was a very small one from the patient's mother. The egg-grafts failed after the first few times and thenceforth I relied mainly on scarlet red and the patient's own powers of epithelization. It was remarked both by the patient and myself that the application of the later egg-grafts caused very profuse secretion which fairly floated them off at the end of forty-eight hours, however carefully applied, and simultaneously the patient's own epithelium appeared to be stimulated to unusual proliferation.

It might be inquired why I made the attempt to skin-graft a score of small areas rather than a few large ones. I did so partly because not all the areas were in suitable condition at once and also because none of the patient's friends could afford to be laid up, but there were many who would give a little skin under local anesthesia with ethyl chlorid. Further, when the early successful grafting was interrupted by sudden and prolonged failure and disaster described above, I feared to continue except tentatively and on a small scale. In the light of present knowledge of anaphylaxis it is probably advisable to do the grafting in as few operations as possible and conclude the work within a few days. This, too, in the case of extensive burns may be dangerous to the patient. The problem, in fact, is one of great difficulty. Desensiti-

zation seems to be possible experimentally and may become so practically. There is still much to be learned in the realm of anaphylactic reaction before we can solve the problems that face us.

One important feature of sensitization is that it may be inherited, Rosenau and Anderson having shown in 1906 that the female guinea-pig may transmit her acquired susceptibility to her young. I know of no evidence that this holds in case of the male parent.

The anaphylactic reaction is more accentuated in proportion as the species concerned are widely separated biologically. Thus Rosenau and Anderson report that guinea-pigs sensitized with egg-white from the hen react to a later injection of the white from a duck's egg, but the reaction is less marked than when horse-serum is used. Further, the discovery of organ specificity by Wolff-Eisner in 1904 opens new difficulties. He found that the guinea-pig may be sensitized by an extract of the lens of its own eye and will react later to an injection of extract of the lens of the other eye, while organ-extracts from other animals easily sensitize.

In the case here reported it is to be noted that not only did two sets of foreign tissue successively lose their power to be transplanted, but also in each case caused distinct reaction in the patient. Yet at the same time, grafts from the patient's sister took to a degree and one from the mother perfectly. One may infer that consanguinity has a favorable influence.

The active immunity acquired in the course of an infectious disease or through the administration of specific vaccines possibly affect the blood so as to permanently influence the reaction of the body toward foreign proteins. Purpura hemorrhagica following an acute infective fever may perhaps be a manifestation of anaphylaxis. In 1901 I reported² such a case of purpura of severe type following an attack of lobar pneumonia in a child aged 4. In that case the pneumonia began February 6 with a definite crisis on the tenth day followed by convalescence. The purpura began March 2 without fever or any symptom of a new infection or recrudescence of the old one. The temperature by March 12 had risen to 101 F., and the blood showed marked evidence of hemolysis. The hemorrhages were profuse and prolonged, involving both the skin and mucous membranes. Was the purpura a secondary infection, or a slowly developing lack of prothrombin or other essential blood-clotting element of the blood, or was it some sort of anaphylactic reaction? My experience thus far leaves me in doubt. One practical lesson from the burn case herewith reported would seem to be that scarlet red and stimulation of the epithelium of the individual are of prime importance.

The patient was under constant care for nine months, but to my gratitude and somewhat to my surprise made a perfect recovery without contractions or impaired motion and no appreciable scars.

Necessity for Vital Statistics.—Sound vital statistics are the fundamental basis of all public health work, and should be the fundamental basis of public health laws. A nation that does not provide for accurately registering the births of its children and the deaths of its citizens, places a low value on human life, and could hardly be supposed to attach much importance to the conservation of human life.—W. F. King, M.D., in *Jour. Indiana State Med. Assn.*

*Special Article*TWELFTH ANNUAL SUMMARY OF
FOURTH OF JULY
INJURIES

This week, for the twelfth consecutive year, THE JOURNAL presents statistics of deaths and injuries resulting from the celebration of the Fourth of July, with particular reference to tetanus, or lockjaw resulting from these injuries. With the rapid decline in

TABLE 1.—CASES OF TETANUS

Name	Sex	Age	Cause of Wound	Site of Wound	Duration in Days*	Day Antitoxin was used	Termination
Wollborn.....	M	13	KENTUCKY Bl. etg.	Hand	(7) 10	9	Death
Peck.....	M	14	MINNESOTA Firearms	Knee	.....	.....	Death
Jarvis.....	M	10	NEW JERSEY Bl. etg.	Hand	(6) 8	.....	Death

* Figures in parentheses show incubation period.

the number of casualties in the last few years, instead of relaxing its vigilance, THE JOURNAL has made extra effort to secure complete and accurate data. As usual during the last few years, a large majority of

TABLE 2.—TETANUS CASES BY STATES
Comparison with Previous Years

	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914
Alabama.....	..	..	1	..	..	..	..	..	..	..	..	..
Arizona.....	..	..	..	1	..	..	..	..	..	..	..	..
California.....	2	4	4	3	1	..	2	1	2	1	..	..
Colorado.....	4	..	1	..	..	..	..	..	..	..	..	..
Connecticut.....	3	..	3	..	4	1	..	..	..	..	..	..
Delaware.....	..	..	1	1	1	..	2	..	..	..	..	..
District of Columbia.....	1	..	..	..	..	..	..	..	..	..	..	..
Florida.....	..	..	..	..	..	1	..	..	..	..	..	..
Georgia.....	..	..	..	..	1	..	..	..	..	..	..	..
Idaho.....	1	..	..	..	..	..	1	..	..	..	..	..
Illinois.....	49	15	20	16	12	12	20	10	3	..	..	..
Indiana.....	11	6	3	8	2	9	6	..	1	1	..	..
Iowa.....	14	2	3	4	4	1	1	1	1	..	..	..
Kansas.....	11	1	..	..	2	1	6	..	..	..	1	..
Kentucky.....	4	2	..	1	..	1	1	..	..	..	..	1
Louisiana.....	4	..	..	..	..	1	..	..	..	..	..	..
Maine.....	2	4	1	1	..	1	..	..	..	..	..	..
Maryland.....	1	..	1	1	..	1	2	1	..	..	..	..
Massachusetts.....	16	5	7	3	2	5	11	1	1	..	..	..
Michigan.....	29	7	0	4	4	2	11	11	2	1	..	..
Minnesota.....	15	2	2	2	2	..	..	..	..	..	..	..
Missouri.....	29	1	3	3	1	5	8	2	..	..	1	..
Montana.....	2	1	1	..	1	..	3	2	..	..	..	..
Nebraska.....	4	3	3	1	..	1	3	1	..	..	..	..
New Hampshire.....	2	..	..	1	..	..	..	..	..	..	..	..
New Jersey.....	8	9	3	10	8	10	19	9	2	..	1	..
New York.....	36	9	6	8	4	9	11	7	1	..	2	..
North Dakota.....	..	..	..	..	..	..	..	..	..	..	..	..
Ohio.....	67	9	5	7	6	7	12	3	3	..	..	..
Oklahoma.....	1	..	1	1	..	1	..	1	..	1	..	..
Oregon.....	2	..	..	1	1	1	..	..	..	..	..	..
Pennsylvania.....	82	17	12	5	7	7	10	11	1	..	..	..
Rhode Island.....	3	..	..	1	..	..	..	..	..	..	..	..
South Carolina.....	..	..	..	..	..	..	..	..	..	..	..	..
South Dakota.....	..	..	..	..	..	1	1	..	..	..	..	..
Tennessee.....	..	..	..	..	..	..	..	..	..	..	..	..
Texas.....	..	..	..	..	2	..	..	..	..	..	..	..
Utah.....	..	1	1	..	2	..	..	1	..	..	..	..
Vermont.....	..	2	..	2	2	..	..	..	..	..	..	..
Washington.....	3	1	..	..	2	4	4	1	..	..	..	..
West Virginia.....	3	..	..	..	..	1	4	3	..	2	..	..
Wisconsin.....	10	4	13	2	3	5	9	3	2	..	..	..
Wyoming.....	..	..	1	..	..	..	..	..	..	..	..	..
Total.....	417	105	104	89	73	70	150	72	18	7	4	3
States having cases...	30	21	23	25	23	20	25	18	10	6	3	3

the blanks were returned from the hospitals with the statement that no cases were treated. From others only a few names were reported, whereas in previous years several pages were required to contain the lists.

Our thanks are extended to health officers, hospital superintendents, physicians and others for the careful reports which have made these statistics practically complete and the figures fairly reliable. The data are presented in the same manner as heretofore so that the comparison with the figures of previous years may be made.

FEWER CASES OF LOCKJAW

Only three cases of tetanus were reported this year as compared with four cases last year, seven cases in 1912, eighteen in 1911, seventy-two in 1910 and 150 in 1909. The returns this year are quite encouraging and give hope that deaths from this needless cause will soon cease.

The ages of the three lockjaw patients this year were 14, 13 and 10 years, respectively, and all were boys. In two cases the injury was on the hand and in the other on the knee. The length of time between injury

TABLE 3.—RATIO OF TETANUS CASES TO BLANK CARTRIDGE INJURIES

Year	Tetanus Cases	Blank Cartridge Injuries	Ratio
1903.....	417	1,672	1 : 4.27
1904.....	105	805	1 : 8.62
1905.....	104	809	1 : 7.78
1906.....	89	979	1 : 11.00
1907.....	73	606	1 : 8.16
1908.....	76	942	1 : 12.39
1909.....	150	1,225	1 : 8.17
1910.....	72	450	1 : 6.25
1911.....	18	185	1 : 10.28
1912.....	7	75	1 : 10.71
1913.....	4	97	1 : 24.25
1914.....	3	122	1 : 40.67
Totals.....	1,118	8,067	1 : 7.22

and death was eight days in one and ten days in another. In the third case the dates were not given by which the time could be computed. The figures in parentheses (Table 1) give the number of days between the time of injury and the appearance of the active symptoms of tetanus, this being in six and seven days, respectively. Antitoxin was used in one

TABLE 4.—CAUSES OF TETANUS CASES

Year	Blank Cartridge	Giant Cracker	Cannon	Fire-arms	Powder, etc.	Total
1903.....	363	17	5	3	29	417
1904.....	74	18	5	1	7	105
1905.....	65	17	4	5	13	104
1906.....	54	17	1	7	10	89
1907.....	52	8	6	4	3	73
1908.....	58	5	4	3	6	76
1909.....	130	9	1	4	6	150
1910.....	64	2	..	5	1	72
1911.....	15	1	1	..	1	18
1912.....	7	..	..	..	..	7
1913.....	4	..	..	..	..	4
1914.....	2	..	..	1	..	3

case but not until the day after the active symptoms had appeared, which is usually too late. The list of tetanus cases is given in Table 1.

DISTRIBUTION OF TETANUS

The tetanus cases by states are shown in Table 2. Cases occurred in only three states this year, no case being in any of the states which reported cases last year. There were cases in six states in 1912, ten states in 1911, eighteen states in 1910 and twenty-

five states in 1909. One case each occurred in Kentucky, Minnesota and New Jersey. The clearing up of deaths from this cause in the last few years as shown by Table 2 is really marvelous.

THE DEADLY BLANK CARTRIDGE

Blank-cartridge wounds, which have always been responsible for a large majority of tetanus cases, this year caused two of the three cases, the other case resulting from a gunshot wound.

TABLE 5.—CASES OF TETANUS FROM OTHER CAUSES

	1908	1909	1910	1911	1912	1913	1914
Alabama.....	..	..	1	1	..	1	..
Arizona.....	..	..	..	..	..	..	..
Arkansas.....	4	1	1	2	7	10	..
California.....	3	..	..	1	..	..	..
Colorado.....	..	..	..	..	..	..	..
Connecticut.....	2	1	..	..	..	..	..
Delaware.....	..	..	..	..	..	..	..
District of Columbia.....	2	..	..	..	..	..	..
Florida.....	..	1	..	..	..	..	..
Georgia.....	..	..	..	..	..	..	..
Idaho.....	17	18	7	6	10	7	..
Illinois.....	6	4	1	2	1	3	1
Indiana.....	2	7	3	1	..	2	1
Iowa.....	4	..	1	..	..	..	..
Kansas.....	5	5	..	1	2	..	2
Kentucky.....	1	..	..	1	3	3	..
Louisiana.....	..	..	..	..	..	..	..
Maine.....	3	..	2	1	1	..	..
Maryland.....	3	5	1	..	..	..	1
Massachusetts.....	4	2	..	..	..	..	..
Michigan.....	..	..	..	..	..	..	..
Minnesota.....	12	5	1	2	3	..	..
Mississippi.....	..	..	..	..	..	..	..
Missouri.....	..	3	1	1	1	..	..
Montana.....	..	..	..	..	..	..	..
Nebraska.....	..	..	..	..	..	..	..
Nevada.....	..	..	..	..	..	..	3
New Hampshire.....	7	8	8	1	..	..	..
New Jersey.....	..	1	..	..	..	..	2
New Mexico.....	17	12	4	2	4	..	..
New York.....	1	..	..	..	..	1	..
North Carolina.....	1	..	..	..	..	..	..
North Dakota.....	1	13	2	..	2	1	3
Ohio.....	23	..	..	..	..	..	..
Oklahoma.....	..	1	3	..	2	..	2
Oregon.....	21	21	8	6	4	1	..
Pennsylvania.....	..	1	..	..	..	..	..
Rhode Island.....	..	..	..	..	..	..	..
South Carolina.....	2	2	..	..	1	1	..
South Dakota.....	3	..	1	..	..	..	..
Tennessee.....	4	1	1	..	..	..	..
Texas.....	..	..	1	..	..	..	..
Utah.....	..	..	..	..	2	1	..
Vermont.....	4	1	..	1	1	..	..
Virginia.....	2	..	..	..	..	..	..
Washington.....	..	1	..	..	..	1	..
West Virginia.....	5	4	1	..	..	..	..
Wisconsin.....	..	..	..	..	..	..	..
Wyoming.....	..	..	..	..	..	..	16
Totals.....	166	128	47	29	44	32	16
States reporting cases.....	29	25	18	15	15	12	8

As may be noted, on comparison of the statistics of this year with those of previous years (Table 3), there is a significant ratio each year between the number of tetanus cases and the number of blank-cartridge wounds. The large increase of injuries from this cause in 1909 resulted in a corresponding increase in the number of cases of tetanus. A reduced number of blank-cartridge wounds almost invariably brings also a smaller number of lockjaw cases. The smaller number of tetanus cases in recent years in proportion to the blank-cartridge injuries is doubtless due to the greater care in treating wounds from this cause and the more common and prompt use of tetanus anti-toxin.

TETANUS FROM INJURIES NOT CAUSED BY FIREWORKS

Besides the cases of lockjaw due directly to the use of fireworks, it is interesting to note those occurring during Fourth of July season which were due to penetrating wounds from other causes, such as nails,

splinters, crushing injuries, etc. There was a continued reduction in these cases this year, only sixteen cases being reported as compared with thirty-two cases last year. Tetanus germs were perhaps as prevalent as in previous years, the reduced number of cases from these other causes being likewise due doubtless to the more common use of tetanus anti-toxin.

OTHER DEATHS AND INJURIES FROM FIREWORKS

Besides the three deaths due to tetanus, thirty-seven persons were killed by various forms of fireworks, making a total of forty deaths, or eight more than last year, one less than in 1912, seventeen less than in 1911 and ninety-one less than in 1910. Although the number is low compared with previous years, still the increase over last year indicates a possible relaxation in the enforcement of the restrictions of last year. This year five persons were killed outright by firearms, six by explosions of powder, bombs or torpedoes, four by cannon and five from blood-poisoning, from rockets, or other forms of fireworks. The most serious fact presented this year is that sixteen persons, mostly little girls or small children, were burned to death by fire from fireworks, three of these being reported as due to supposedly harmless sparklers!

As heretofore, all accidents not due directly to the discharge or handling of fireworks or other means of noise production and display on or about the Fourth of July have been omitted. Table 6 shows a comparison of the causes of death aside from tetanus for the past ten years.

DISTRIBUTION OF INJURIES

In Table 7 a summary of all injuries, including tetanus, and of all causes, is given arranged by states. Beneath the totals at the bottom are given, for comparison, the totals for the eleven previous years and the grand totals for the twelve years. Table 8 permits the comparison by states of the total deaths and injuries for eleven years. The number of casualties

TABLE 6.—CAUSES OF DEATHS NOT DUE TO TETANUS

Year	Gun-shot	Fire from Fire-works	Powder, Tor-pedoes, etc.	Giant Crack-ers	Can-non	Other Causes	Total
1905.....	37	23	6	5	7	17	95
1906.....	38	18	18	3	3	3	83
1907.....	20	31	13	13	3	22	102
1908.....	30	22	19	23	7	7	108
1909.....	17	37	16	7	3	3	90
1910.....	19	26	11	2	5	8	64
1911.....	11	12	9	2	2	7	47
1912.....	9	8	7	2	1	1	35
1913.....	8	13	6	..	4	5	29
1914.....	5	16	6	1	..	..	37
Totals.....	194	206	111	53	42	79	680

this year was 1,506, an increase of 343 over last year and an increase of 518 of the casualties reported for 1912. This increase is seen in the majority of states. Pennsylvania had 487 casualties this year, a decrease of only 4 cases below last year but an increase of 222 cases over the number reported in 1912. New York had 250 casualties, or almost double the number reported last year. Illinois reported 95 cases this year, which is more than twice as many as last year, although it is still a great reduction below the enormous totals annually reported prior to 1912. Massachusetts and Connecticut reported, respectively, 87

and 77 cases this year, the largest totals in those states since 1910. The figures for the last three years are very small compared with the previous years for California, Indiana, Iowa, Missouri, New Jersey, Ohio and Wisconsin. Continued reductions are seen this year only in Missouri, Nebraska, Ohio and Washington. Pennsylvania still leads in having by far the largest number of casualties. Meanwhile, of the 487 casualties in Pennsylvania, 241 (about half) were reported from Philadelphia this year as compared with 340 in that city in 1913.

NATURE OF NON-FATAL INJURIES

There were 1,466 non-fatal injuries this year, or 335 more than last year and 519 more than 1912.

Three persons were totally blinded this year, thirteen lost one eye each, sixteen lost legs, arms or hands, and sixty-seven lost one or more fingers. As there has been a considerable increase in the total number of non-fatal injuries, so have the totals of these more severe injuries been increased. This year 402 injuries were due to the giant firecracker, which continues to hold the first place as a cause of lacerated wounds and was responsible for most of the losses of eyes, hands, and fingers. A surprisingly increased number of injuries were caused by firearms this year, 231 cases being reported including five deaths. As usual, many of these injuries were caused by stray bullets from the reckless use of firearms by other persons. The use of cannon, including many of the improvised

TABLE 7.—SUMMARY BY STATES OF FOURTH OF JULY CASUALTIES

Marginal Number	States	Deaths			Injuries				Total Persons Dead or Injured	Causes of Tetanus Cases		Causes of all Cases Aside from Tetanus Cases					Marginal Number	
		From Tetanus	From Other Causes	Total	Loss of Sight	Loss of One Eye	Loss of Legs, Arms or Hands	Loss of Fingers, One or More		Other Injuries	Total Non-Fatal Injuries	Blank Cartridge	All Other Causes	Blank Cartridge	Firecracker	Cannon		Firearms	Powder and Fire-works
1	Alabama.....																	1
2	Arizona.....		1	1					1	1	2		1				1	2
3	Arkansas.....																	3
4	California.....					2	1	2	19	24	24	1	10	3	4	6	4	4
5	Colorado.....								3	3	3		2			1	5	
6	Connecticut.....							4	73	77	77	21	8	13	14	21	6	
7	Delaware.....								8	8	8		6		1	1	7	
8	District of Columbia.....						1			1						1	8	
9	Florida.....																9	
10	Georgia.....																10	
11	Idaho.....							1		1						1	11	
12	Iowa.....		2	2					80	89	95	7	27	10	11	40	12	
13	Kansas.....				1				58	60	62	1	19	3	11	28	13	
14	Kentucky.....	1		1				2	24	25	27		16	2		9	14	
15	Louisiana.....								6	7	7		1	4	2		15	
16	Maine.....								8	10	11	1	4		3	3	16	
17	Maryland.....								4	4	4		2		1	1	17	
18	Massachusetts.....		2	2			3		6	6	6		2	1		3	18	
19	Michigan.....		1	1	1	2			9	10	10		3	4	4	1	19	
20	Minnesota.....		2	2				2	80	85	87	6	27	4	7	43	20	
21	Mississippi.....	1		1				1	62	71	72		29	9	3	31	21	
22	Missouri.....					1			9	11	12	1	2		1	5	22	
23	Montana.....																23	
24	Nebraska.....		1	1			1	4	47	52	53		19	3	14	17	24	
25	Nevada.....							1		1						1	25	
26	New Hampshire.....								10	10	10		5	1	2	2	26	
27	New Jersey.....	1		1		1	2	2	15	15	15	1	1	5	3	2	27	
28	New Mexico.....								49	54	55		5	4	4	19	28	
29	New York.....		6	6		3	2	11	228	241	250	39	65	23	63	60	29	
30	North Carolina.....																30	
31	North Dakota.....																31	
32	Ohio.....		1	1													32	
33	Oklahoma.....		1	1					40	44	45		19	6	6	14	33	
34	Oregon.....								3	3	4		1		2	1	34	
35	Pennsylvania.....		9	9	1	1	5	15	5	5	5		1			4	35	
36	Rhode Island.....		1	1					456	478	487	29	103	44	48	263	36	
37	South Carolina.....								24	21	25	6	5	2	5	7	37	
38	South Dakota.....								1	1	1					1	38	
39	Tennessee.....								1	1	1						39	
40	Texas.....								1	1	1				1		40	
41	Utah.....																41	
42	Vermont.....																42	
43	Virginia.....					1			3	3	3	1	1		2	1	43	
44	Washington.....		2	2					3	5	5						44	
45	West Virginia.....								3	3	5	1	1		1	2	45	
46	Wisconsin.....		2	2					8	8	8				1	1	46	
47	Wyoming.....								21	21	23			4		1	47	
48	1914 totals.....	3	37	40	3	13	16	67	1,367	1,466	1,506	2	122	402	143	231	605	48
49	1913 totals.....	3	29	32	2	22	10	46	1,051	1,131	1,163	4	97	312	169	519	51	49
50	1912 totals.....	6	35	41	8	21	13	43	862	947	988	7	70	362	157	317	52	50
51	1911 totals.....	10	47	57	8	26	30	83	1,399	1,546	1,603	15	3	170	484	114	337	51
52	1910 totals.....	67	64	131	7	33	26	114	2,612	2,792	2,923	64	8	356	1,050	212	633	52
53	1909 totals.....	125	90	215	16	36	41	176	4,823	5,092	5,207	130	20	1,095	1,614	427	974	53
54	1908 totals.....	55	108	163	11	93	57	184	5,115	5,460	5,623	58	18	816	1,793	399	1,680	54
55	1907 totals.....	62	102	164	12	75	57	237	3,838	4,249	4,413	52	21	551	1,459	267	2,058	55
56	1906 totals.....	75	83	158	22	72	56	237	4,931	5,308	5,496	54	35	925	1,690	495	1,528	56
57	1905 totals.....	87	95	182	25	106	80	231	4,562	4,994	5,176	65	39	744	1,775	474	1,822	57
58	1904 totals.....	91	92	183	19	61	61	208	3,637	3,856	4,169	74	25	851	1,268	508	1,675	58
59	1903 totals.....	406	60	466	10	75	54	174	3,670	3,883	4,449	263	291	1,390	1,152	597	1,057	59
60	Total for twelve years.....	900	812	1,832	143	633	501	1,780	37,897	40,954	42,784	558	190	7,119	13,291	3,456	13,821	60
61																		61

* Kind of fireworks causing six tetanus cases unknown.

† Kind of fireworks causing 24 cases of tetanus unknown.

variety, resulted in 143 injuries this year, including four killed. In the twelve years, a total of 42,786 persons—the equivalent of over forty regiments—were killed or injured in the celebration of the Fourth of July.

TOTALS IN CHIEF CITIES

Table 9 shows the number reported killed and injured in our largest cities each year and the totals for the past eight years. The cities are arranged according to their population as given by the United States census in 1910. This table is of particular interest, since the results in each city in which prohibitive or restrictive ordinances have been adopted

TABLE 8.—TOTAL DEATHS AND ACCIDENTS BY STATES DURING ELEVEN YEARS

	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914
Alabama.....	7	1	2	1	1	1	1	1	3	3	2	1	...	...
Arizona.....	...	4	5	2	5	1	3	...	...	...	...	...	...	...
Arkansas.....	...	3	4	...	5	1	...	...	...	...	...	...	...	...
California.....	135	142	94	121	156	89	63	43	31	23	...	...	...	...
Colorado.....	41	26	23	25	13	18	10	6	21	...	...	...	...	...
Connecticut.....	133	152	169	63	105	86	78	15	30	50	77	...	...	...
Delaware.....	5	14	8	16	12	13	8	3	6	6	8	...	...	...
Dist. of Columbia	10	24	5	12	21	...	...	...	...	...	...	...	...	...
Florida.....	2	2	...	...	...	...	...	...	...	...	...	...	...	...
Georgia.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Idaho.....	4	3	3	4	4	...	...	...	...	...	...	...	...	...
Illinois.....	423	542	598	468	558	516	275	218	39	47	95	...	...	...
Indiana.....	211	217	250	...	235	161	167	63	43	12	62	...	...	...
Iowa.....	157	228	255	231	174	91	141	51	24	22	27	...	...	...
Kansas.....	88	56	61	64	72	80	50	25	8	5	7	...	...	...
Kentucky.....	72	17	21	18	33	17	26	6	5	2	11	...	...	...
Louisiana.....	...	3	7	8	4	...	...	...	...	...	...	...	...	...
Maine.....	32	29	15	11	16	22	7	4	...	...	...	...	...	...
Maryland.....	23	13	10	23	21	10	8	13	11	15	10	...	...	...
Massachusetts.....	193	467	229	168	430	63	27	45	43	87	...	...	...	...
Michigan.....	157	288	193	163	203	177	143	69	50	21	72	...	...	...
Minnesota.....	102	174	95	95	65	69	61	17	17	6	12	...	...	...
Mississippi.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Missouri.....	84	218	325	290	375	352	112	60	57	83	53	...	...	...
Montana.....	17	40	3	6	11	9	10	...	...	...	...	...	...	...
Nebraska.....	63	43	47	58	46	42	26	17	12	17	10	...	...	...
Nevada.....	1	2	...	1	4	...	...	...	...	...	...	...	...	...
New Hampshire.....	23	9	29	13	13	23	10	2	3	...	...	...	...	...
New Jersey.....	201	350	398	402	452	458	167	43	16	21	55	...	...	...
New Mexico.....	4	5	1	6	...	...	...	...	...	...	...	...	...	...
New York.....	549	566	681	752	647	897	327	237	115	144	250	...	...	...
North Carolina.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
North Dakota.....	8	29	11	8	13	4	13	1	2	...	...	...	...	...
Ohio.....	327	329	410	575	513	323	166	105	55	70	45	...	...	...
Oklahoma.....	3	7	14	194	9	12	11	9	11	1	4	...	...	...
Oregon.....	13	9	11	5	9	21	19	3	5	4	5	...	...	...
Pennsylvania.....	744	721	969	491	987	986	63	442	265	491	487	...	...	...
Rhode Island.....	30	11	21	39	39	42	19	11	2	21	25	...	...	...
South Carolina.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
South Dakota.....	10	15	5	8	10	9	4	2	...	...	...	...	...	...
Tennessee.....	1	5	6	4	5	4	10	3	12	3	1	...	...	...
Texas.....	2	4	11	7	11	4	2	...	3	2	...	...	...	...
Utah.....	22	25	18	20	12	18	8	2	1	1	...	...	...	...
Vermont.....	14	10	14	18	19	12	4	4	1	...	...	...	...	...
Virginia.....	11	5	8	...	5	...	...	...	...	...	...	...	...	...
Washington.....	25	15	25	23	38	37	22	12	13	5	...	...	...	...
West Virginia.....	16	34	61	27	29	35	20	2	2	3	8	...	...	...
Wisconsin.....	215	230	155	150	187	157	171	52	38	16	23	...	...	...
Wyoming.....	2	8	3	...	1	4	...	...	...	...	...	...	...	...
Totals.....	4169	5176	5466	4413	5623	5307	2923	1603	988	1163	1506	...	...	...

can be seen. Prohibitive ordinances were enforced in Baltimore, Boston, Chicago, Cleveland, Minneapolis, Newark, St. Paul, Toledo, Trenton, Washington and elsewhere. Restrictive measures were used in New York, St. Louis, Pittsburgh, Buffalo and elsewhere. Philadelphia reported four deaths this year, Chicago reported three, Buffalo reported two, and one each was reported for New York, St. Louis, Pittsburgh, Newark, N. J., Scranton, Pa., Springfield, Mass., Tacoma, Wash., Duluth, Minn., and Peoria, Ill., making a total of eighteen deaths in twelve of our eighty-four largest cities, as compared with seven killed last year, twelve in 1912, sixteen in 1911, forty-three in 1910 and eighty in 1909. For the last four years Philadelphia has been the only large city having

more than 100 injuries, having reported 237 this year, a decrease of 103 below last year. Altogether 681 non-fatal injuries were reported for these large cities this year, as compared with 854 last year, 522 in 1912, 774 in 1911, 1,457 in 1910 and 2,936 in 1909. A slight increase over last year is seen in the records of some of these cities, although others, notably St. Louis, Boston, Baltimore, Pittsburgh, Buffalo, Milwaukee and others, have brought the returns considerably below last year's record. Of these eighty-four cities, twenty-three have a record of six or more injured, two less than last year, and twenty-four less than 1909. Twenty-four of these cities had a clean record this year, as compared with thirty-one last year, thirty in 1912, twenty-four in 1911, and eighteen in 1910. Probably the most marked reduction in the number of injured in the last few years have been in Chicago, St. Louis, Boston, Pittsburgh, Milwaukee and Newark. From Newark no casualties were reported in 1912 and 1913 and only two this year, a decided contrast to the record of 1909, when 150 were injured and one person was killed. It is noteworthy that nearly half of all casualties this year were in sixty-two of these larger cities.

WHERE THE RESPONSIBILITY RESTS

As has been repeatedly stated in these annual reports, for the great majority of Fourth of July injuries, *the responsibility clearly rests with city governments*, since the employment of death-dealing methods of celebration is subject to their regulation. It is clearly the duty of city authorities, therefore, to decide whether or not the maiming of hundreds, the agonizing deaths from lockjaw and the burning to death of little children by fire from fireworks are to be continued. Rigidly enforced prohibitive ordinances in sixty-two of our largest cities, therefore, would do much toward doing away with this national disgrace. Prohibitive ordinances are most effective and permanent, as shown by the results in Baltimore, Cleveland, Newark, Trenton, Chicago, Washington and elsewhere, and even restrictive ordinances, if they could be rigidly enforced, would have good results. But the enforcement of restrictive measures is difficult and requires constant vigilance on the part of the police. By the sound it is difficult to know whether an explosion is due to a firecracker 3 inches long or to one 5 inches long, or whether it is due to some other forbidden form of fireworks. Again, restrictive ordinances are usually looked on as half-way measures and are not expected to be enforced. Not so prohibitive ordinances, however, under which any explosion is recognized at once as a violation of the law. Again, ordinances which are merely restrictive are ineffectual since the smaller firecracker and sparklers which have been considered so harmless caused the fires this year by which sixteen children, mostly little girls, were burned to death.

CONCLUSIONS

In spite of the slightly reduced number of tetanus cases this year the returns are somewhat discouraging. The increased number of killed and injured indicates a relaxation in the enforcement of the ordinances which were so ably enforced two years ago. Instead of a relaxation of restrictive measures, the use of fireworks in the celebration of the Fourth of July should be strictly prohibited. To kill outright forty persons and to wound and maim 1,466 others is not a very fitting token of our thankfulness for the

and murder? The results of two years ago show plainly that these evils can be entirely done away with. It is hoped that city officials will continue their prohibitive measures until this desirable end is attained.

TABLE 9.—NUMBER REPORTED KILLED AND INJURED IN THE LARGER CITIES DURING EIGHT YEARS

Marginal Number	City	1907		1908		1909		1910		1911		1912		1913		1914		Totals		Marginal Number	
		Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured		
1	New York City.....	12	42	11	316	7	539	6	139	3	91	1	38	65	1	94	51	1,784	1		
2	Chicago.....	16	151	12	202	118	118	62	62	53	53	1	12	13	3	18	40	622	2		
3	Philadelphia.....	248	248	6	126	28	28	4	436	24	24	127	3	340	4	237	25	2,583	3		
4	St. Louis.....	182	182	4	129	4	163	44	44	38	38	48	1	72	1	43	13	836	4		
5	Boston.....	3	3	6	129	5	167	1	1	1	1	16	1	15	1	15	15	493	5		
6	Cleveland.....	3	3	12	93	4	4	1	1	1	1	1	1	13	1	1	15	172	6		
7	Baltimore.....	3	3	1	10	1	1	1	1	1	1	1	1	1	1	1	6	64	7		
8	Pittsburgh.....	10	88	30	30	49	49	6	6	10	10	1	1	12	1	11	25	238	8		
9	Detroit.....	10	46	30	30	43	43	1	1	15	15	1	1	4	1	43	8	203	9		
10	Buffalo.....	10	16	3	11	11	11	1	1	15	15	1	1	16	1	9	6	122	10		
11	San Francisco.....	1	1	11	11	12	12	1	1	9	9	1	1	16	1	4	1	60	11		
12	Milwaukee.....	1	93	70	70	78	78	112	112	1	19	1	1	19	1	1	1	414	12		
13	Cincinnati.....	1	1	112	112	3	3	3	3	49	49	1	1	26	1	1	11	321	13		
14	Newark, N. J.....	1	123	81	81	1	159	1	15	3	3	1	1	1	1	1	5	277	14		
15	New Orleans.....	1	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	36	15		
16	Washington, D. C.....	1	12	21	21	1	1	1	1	1	1	1	1	1	1	1	1	37	16		
17	Los Angeles, Cal.....	1	21	40	40	26	26	1	1	1	1	1	1	1	1	1	1	117	17		
18	Minneapolis, Minn.....	1	13	10	10	1	24	1	20	1	1	1	1	2	1	1	1	70	18		
19	Jersey City, N. J.....	1	31	34	34	1	14	1	44	14	14	1	1	1	1	1	1	142	19		
20	Kansas City, Mo.....	1	4	55	55	4	67	1	25	4	4	1	1	1	1	1	1	168	20		
21	Seattle, Wash.....	1	1	1	1	3	10	1	1	1	1	1	1	1	1	1	1	26	21		
22	Indianapolis, Ind.....	1	31	1	14	1	35	1	24	1	1	1	1	1	1	1	1	127	22		
23	Providence, R. I.....	1	20	1	21	13	13	1	10	1	1	1	1	17	1	11	4	97	23		
24	Louisville, Ky.....	1	13	10	10	1	10	1	13	1	1	1	1	1	1	1	1	61	24		
25	Rochester, N. Y.....	1	12	10	10	5	5	1	10	1	1	1	1	1	1	1	1	35	25		
26	St. Paul, Minn.....	1	20	13	13	19	19	1	12	1	1	1	1	1	1	1	1	86	26		
27	Denver, Colo.....	1	8	13	13	12	12	1	6	1	1	1	1	1	1	1	1	50	27		
28	Portland, Ore.....	1	3	3	3	16	16	1	13	1	1	1	1	1	1	1	1	37	28		
29	Columbus, Ohio.....	1	3	3	3	1	19	1	1	1	1	1	1	1	1	1	1	64	29		
30	Toledo, Ohio.....	1	1	3	3	2	2	1	2	1	1	1	1	1	1	1	1	28	30		
31	Atlanta, Ga.....	1	4	3	3	1	1	1	3	1	1	1	1	1	1	1	1	54	31		
32	Oakland, Cal.....	1	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1	29	32		
33	Worcester, Mass.....	1	1	20	20	1	42	1	6	1	1	1	1	14	1	3	4	102	33		
34	Syracuse, N. Y.....	1	23	14	14	13	13	1	6	1	1	1	1	15	1	6	79	34			
35	New Haven, Conn.....	1	2	15	15	1	1	1	1	1	1	1	1	10	1	1	4	34	35		
36	Birmingham, Ala.....	1	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1	3	36		
37	Memphis, Tenn.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13	37		
38	Scranton, Pa.....	1	3	1	17	1	23	1	6	1	1	1	1	9	1	15	1	91	38		
39	Richmond, Va.....	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	5	39		
40	Paterson, N. J.....	1	23	2	21	1	45	1	14	1	1	1	1	4	1	6	2	130	40		
41	Omaha, Neb.....	1	23	10	1	17	1	17	1	1	1	1	1	16	1	1	2	100	41		
42	Fall River, Mass.....	1	1	12	1	19	1	1	1	1	1	1	1	1	1	1	1	35	42		
43	Dayton, Ohio.....	1	11	14	1	4	1	1	1	1	1	1	1	1	1	1	1	37	43		
44	Grand Rapids, Mich.....	1	20	1	20	3	3	1	1	1	1	1	1	13	1	1	1	104	44		
45	Nashville, Tenn.....	1	23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	45		
46	Lowell, Mass.....	1	23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	46		
47	Cambridge, Mass.....	1	17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	47		
48	Spokane, Wash.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21	48		
49	Bridgeport, Conn.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21	49		
50	Albany, N. Y.....	1	24	1	27	1	31	1	1	1	1	1	1	1	1	1	1	84	50		
51	Hartford, Conn.....	1	18	15	1	11	1	14	1	1	1	1	1	9	1	1	1	113	51		
52	Trenton, N. J.....	1	28	1	1	58	1	1	1	1	1	1	1	1	1	1	1	101	52		
53	New Bedford, Mass.....	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	116	53		
54	Reading, Pa.....	1	17	13	1	17	1	2	1	1	1	1	1	1	1	1	1	83	54		
55	San Antonio, Tex.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	55	55	
56	Camden, N. J.....	1	16	29	4	14	1	6	1	1	1	1	1	1	1	1	1	66	56		
57	Salt Lake City.....	1	15	6	2	14	1	4	1	1	1	1	1	1	1	1	1	41	57		
58	Lynn, Mass.....	1	3	11	3	16	1	4	1	1	1	1	1	1	1	1	1	3	58	58	
59	Springfield, Mass.....	1	21	1	35	1	9	1	2	1	1	1	1	1	1	1	1	73	59		
60	Wilmington, Del.....	1	14	13	3	9	1	6	1	1	1	1	1	1	1	1	1	62	60		
61	Des Moines, Iowa.....	1	51	41	1	13	1	23	1	12	1	1	1	6	1	1	1	132	61		
62	Lawrence, Mass.....	1	11	1	5	12	1	1	1	1	1	1	1	1	1	1	1	23	62		
63	Tacoma, Wash.....	1	4	3	1	3	1	1	1	1	1	1	1	1	1	1	1	13	63		
64	Kansas City, Kan.....	1	10	17	33	1	14	1	1	1	1	1	1	1	1	1	1	79	64		
65	Yonkers, N. Y.....	1	32	5	8	1	1	1	1	1	1	1	1	1	1	1	1	49	65		
66	Houston, Texas.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	66	66	
67	Duluth, Minn.....	1	13	9	10	1	1	1	1	1	1	1	1	1	1	1	1	37	67		
68	St. Joseph, Mo.....	1	23	1	41	1	24	1	11	1	1	1	1	1	1	1	1	103	68		
69	Somerville, Mass.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	69	69	
70	Troy, N. Y.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	70	70	
71	Utica, N. Y.....	1	18	1	10	1	1	1	1	1	1	1	1	1	1	1	1	22	71	71	
72	Waterbury, Conn.....	1	8	14	1	1	1	1	1	1	1	1	1	1	1	1	1	43	72	72	
73	Schenectady, N. Y.....	1	4	20	1	1	1	1	1	1	1	1	1	1	1	1	1	23	73	73	
74	Hoboken, N. J.....	1	1	24	1	1	1	1	1	1	1	1	1	1	1	1	1	55	74	74	
75	Elizabeth, N. J.....	1	43	72	1	1	1	1	1	1	1	1	1	1	1	1	1	37	75	75	
76	Manchester.....	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	168	76	76	
77	Evansville, Ind.....	1	5	12	1	1	1	1	1	1	1	1	1	1	1	1	1	13	77	77	
78	Norfolk, Va.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	40	78	78	
79	Wilkes-Barre, Pa.....	1	3	32	1	15	1	1	1	1	1	1	1	1	1	1	1	1	1	79	79
80	Peoria, Ill.....	1	8	27	1	1	1	1	1	1	1	1	1	1	1	1	1	69	80	80	
81	Erie, Pa.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	79	81	81	
82	Savannah, Ga.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	82	82	
83	Harrisburg, Pa.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	121	83	83	
84	Portland, Me.....	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	84	84	
Totals.....		94	2,438	83	2,860	80	2,996	43	1,437	16	774	12	522	10	854	18	681	336	12,542		
Totals elsewhere.....		70	1,791	80	2,600	135	2,153	88	1,835	41	772	29	423	22	709	22	825	457	10,210		
Grand totals.....		164	4,229	163	5,460	215	5,091	131	2,732	57	1,546	41	945	32	1,563	40	1,506	793	22,752		

THE JOURNAL OF THE
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SATURDAY, AUGUST 29, 1914

THE FOURTH OF JULY CELEBRATION IN 1914

The Fourth of July has again come and gone. A sufficient time has passed to collect and to verify all reports of deaths and serious injuries. All cases of tetanus developing from injuries received in the celebration have been recorded, and the tabulated statistics of all casualties are printed this week on another page.

DEATHS AND INJURIES THIS YEAR

The returns show a continued increase over the casualties of two years ago, there being 1,506 this year as compared with 1,163 last year and 988—the lowest number—in 1912. There were 40 deaths this year as compared with 32 last year—the lowest number—and 41 in 1912. There were only 3 cases of tetanus—the lowest number—compared with 4 last year and 7 in 1912. These returns are very low, however, when compared with 130 cases of tetanus, 215 deaths and a total of 5,307 casualties, which was the record for 1909, only five years ago. Again, the fact that there were two days for celebration both last year and this (Sunday coming next to the holiday), may have had considerable to do with the comparatively slight increases of the last two years.

EVIDENCES OF PROGRESS

In spite of the slight increase in the numbers of killed and injured there are abundant reasons why those who are laboring for better forms of celebration should feel encouraged. Never has any cause been taken up so effectively by the public press as has this movement for a "safe and sane celebration of the Fourth of July"—an expression which has become so familiar in a few brief years. Never before has public sentiment been so unanimous or positive as in the overwhelming demand for a cessation of the noisy and destructive methods of celebration. And this year these evidences were more marked than ever. Besides the splendid service rendered by the newspapers in the work for reform, societies and associations, municipal, state and national in their scope, have been unusually active.

PROHIBITIVE MEASURES

In at least eight states—Arkansas, Indiana, Kansas, Nebraska, New York, Ohio, Pennsylvania and Texas

—just prior to the Fourth, the state fire commissioners sent special communications to the cities and towns throughout their states urging that the use of fireworks be discontinued or carefully safeguarded. In one state, Kansas, a model prohibitive ordinance was circulated which, according to the report, was adopted and enforced in over a hundred cities. This is a plan worthy of being followed elsewhere. It points to the prompt solution of the problem since the control of the use of fireworks clearly rests with city and town governments. Reports of the enforcement of prohibitive measures came from hundreds of cities in all sections of the country. This positive method of stamping out lawlessness, noise and destruction is clearly sweeping the land. That many of our larger cities have greatly improved their records in recent years by such measures may be noted in Table 9 on page 781.

NEWER AND BETTER METHODS SUBSTITUTED

Mere prohibitive measures have been surpassed in effectiveness, perhaps, by the wide adoption of better forms of celebration. Band concerts, picnics, parades and programs of various sorts have never been so generally in evidence as on the Fourth of July this year. This is the strongest indication that the reform is to be permanent. Never before has there been so general a display of flags in both public and private places. From all over the land came reports showing the cessation of noise, the absence of fires, formerly so common, and less need of constant vigilance by the police to restrain the more noisy celebrants. From everywhere came comments regarding the absence of deaths and injuries from the use of fireworks. How different from the awful results reported annually up to only a few brief years ago!

SIGNIFICANCE OF THE CHANGE

The watchword of this country has been personal liberty, which was heralded to the world by the Declaration of Independence, the signing of which is celebrated on the Fourth of July. The manner of observing this day, therefore, may be taken as a fair index of other tendencies in our national life. The individual was at liberty to celebrate the Fourth of July just as he was given the widest freedom in religion, in business and in other walks of life. But as the absence of restrictions led to abuses in the business world, so unlimited freedom gradually led to abuses in celebrating our Independence Day. The nation is learning that the greatest liberty to the greatest number demands that certain restrictions be placed on the liberty of the individual. In order to correct abuses in the business world in recent years much publicity has been given to political and commercial trickery and graft in high places and low, and there is a decided trend toward improvement.

The liberty to use fireworks in the celebration of the Fourth of July gradually degenerated into an annual orgy during which hoodlums held free license to kill,

to maim and to destroy. So general and so free had the use of fireworks become that even babes were suffered to handle fireworks, so often deadly even to adults accustomed to handling them. So bad had conditions grown that the celebration was annually demanding a toll of hundreds of children dying in the agonies of lockjaw, burned to death, shot down or otherwise slain, while thousands of others were blinded, maimed for life or otherwise injured.

BEGINNING OF THE CHANGE

So settled was the nation in this annual holocaust that it had come to be looked on almost as essential, and it required that the awful results be given publicity by *THE JOURNAL* time and time again through six years before the public could be induced to shake off its lethargy, and before any check could be placed on the crimes being committed annually in the name of patriotism. For six years *THE JOURNAL*'s reports with a few exceptions seemed to fall on deaf ears. A notable exception was the *Chicago Tribune*, which as a news feature for several years immediately following the Fourth had published unverified figures of the deaths and injuries. In spite of reports, however, the total casualties continued to increase until in 1908 there were 5,623 people killed and injured! In that year *THE JOURNAL* in its report published the returns from the forty-two largest cities. The figures revealed the fact that a great majority of the deaths and injuries were clearly due to lawlessness and disorder permitted in those cities. The corollary was also made clear that the governments of these cities were responsible for such casualties, inasmuch as they could be prevented by the enforcement of prohibitive measures. From that time on a wave of public opinion demanding a change of methods has been gathering and has grown with each succeeding year. This year the demand has been so decided as to leave no room for doubt as to the final outcome—the nation is to be freed from this annual holocaust in the name of American freedom.

THE CELLS IN COW'S MILK

The importance of cow's milk in the dietary of the well and the sick alike, and its indispensability as an article of food in the nourishment of a great group in our infant population tend to keep alive a wide-spread interest in the quality and purity of the available supply.

The significance of bacteria in milk, their influence in modifying its keeping properties, their possible danger as sources of infection—all of these facts have become a part of the common store of knowledge. Information concerning them has been spread broadcast, in magazines and daily newspapers. The problem of other structural elements in milk has not reached the public eye to the same extent; indeed, it has scarcely passed beyond the stage of scientific inquiry.

Many of the secretions of the body contain cells discharged from the tissues, and these cells in general are of two kinds: (a) epithelial cells discharged either from the secreting portions of the glands or from the lining of ducts or general epithelial surfaces, and (b) leukocytes which make their way through the walls of the capillaries and the lymphatics into the epithelial layers which produce the secretion of the gland and, finally, into the secretion itself. Under certain pathologic conditions the discharge of these cells may increase greatly above the normal amount. Milk ordinarily contains such cells. They were first described in connection with colostrum under the name of colostrum corpuscles.¹ American investigators² long ago called attention to the occurrence of leukocytes in market milk; and by speaking of them as "pus" cells (as is commonly done of leukocytes in urine) an imputation of possible danger was early placed on the fluid containing them. The question of the sanitary significance of the cells in milk has since then assumed considerable importance. A great deal of confusion in the discussion of the nature of these cells and their hygienic significance has been due to the assumption by many investigators that the presence of the cells under any conditions is a pathologic phenomenon and therefore undesirable. As a matter of fact the leukocytes which have passed through the epithelial lining of the alveolus in some part of the mammary gland under normal conditions are not pus cells any more than leukocytes in the lymph and blood, saliva and other secretions are pus cells.

As often happens in the progress of experimental research, imperfect methods of investigation have furnished apparently conflicting answers to the questions here involved. At one time the sediment of milk was depended on to disclose the presence of the cells. Subsequently it was found that many of these may be missed by this method of examination because they may rise with the cream layer and thus fail to appear in the sedimentary deposits. The whole situation, which is evidently in need of revision and supplementary study, has been reviewed by the bacteriologist of the New York Agricultural Experiment Station at Geneva.³ The evidence thus far obtained indicates that the largest average number of cells occurs in colostrum milk, though equally large numbers of cells occasionally occur in milk drawn at any time during the lactation period. Several very high cell-counts have been obtained from the milk of animals nearing the end of the lactation period, and the evidence given indicates that such high counts are more common during the latter part of the period than during its height; but the average cell-counts for the latter part of the period do not seem to be markedly higher than

1. Donne, A.: Du lait et en particulier de celui des nourrices, Paris, 1837.

2. Stokes, W. R., and Wegfarth, A.: The Microscopic Examination of Milk, *Med. News*, 1897, lxxi, 45.

3. Breed, R. S.: Cells in Milk Derived from the Udder, New York Agric. Expt. Station, Bull. 380, March, 1914.

the average cell-counts for the earlier part. There are marked daily variations in the number of cells discharged, the cause or causes of which have not yet been discovered. No constant relationship holds between the number of cells discharged in the fore-milk and the number discharged later in the milking process. There is a constant increase in the number of cells discharged in the strippings, the cause of which is not yet clear. The four quarters of the udder do not act as a unit in the discharge of the cells, but show as wide variations in number and character of the cells discharged as do separate udders.

The number of cells found in the milk of an ordinary dairy may come as a surprise to many. Out of the 122 cows whose milk has been examined, 59 were found to give cell-counts under 500,000 per cubic centimeter, 36 gave counts between 500,000 and 1,000,000 per cubic centimeter and 27 gave counts of over 1,000,000 per cubic centimeter. The average cell-counts for all of the cows was 868,000 cells per cubic centimeter. The milk of all the cows was normal in appearance and was sold or used by their owners, who had every reason to suppose that the milk was normal milk. Milking-machines, which are being operated more and more extensively in the dairy industry, have been charged with inducing a greater exodus of cells into the milk owing to the vacuum that these mechanical devices create. Dr. Breed states that several things seem to indicate that the number of cells present in milk drawn by a vacuum machine is somewhat less than the number present in hand-drawn milk. The results obtained show that there is no reason for thinking that changes in the vacuum or high vacuums may, in themselves, cause the discharge of excessive numbers of cells, or that high vacuums may draw blood from the interior of the udder.

The leukocytes predominate among the cells. The epithelial cells and fragments are presumably discharged because they are worn out or dislodged in the process of the secretion of the milk. The reason for the presence of the leukocytes is not so clear. By analogy with known leukocytic wanderings in certain pathologic states it has been widely held that the blood-cells are attracted into the milk by the presence of bacteria in the udder, especially by the particular kind of bacteria known as the pus-forming streptococci. This belief has arisen because of a large body of evidence which indicates that the milk of cows suffering from mastitis caused by a streptococcic infection, ordinarily, if not invariably, contains large numbers of cells. Dr. Breed has pointed out, however, that no systematic attempt has yet been made to discover whether there is a relationship between the number and kinds of cells discharged and the bacterial content of the udder which frequently harbors micrococci. He inclines to the belief that there are other reasons for the discharge of leukocytes in the milk than the pres-

ence of bacteria in the udder. These other reasons undoubtedly have to do with the physiologic conditions surrounding the process of milk secretion. The chapter dealing with the hygienic significance of the cells cannot yet be regarded as closed.

PLUMBING AND HEALTH

It is not surprising perhaps that old ideas concerning the causes of disease survive in some strata of society a long time after these ideas have been generally outgrown or discredited. All the same it is a little disconcerting to find that typhoid fever can still be complacently attributed to bad plumbing. When we read that "insufficient laws regulating plumbing and sanitation in Virginia, Maryland and the District of Columbia are largely responsible for the high typhoid rate and the prevalence of other diseases in the two states and the district," and again that "much of the fever and other forms of disease with which the health authorities are constantly wrestling is caused by noxious gases and vapors emanating from neglected or defective pipes in the homes of the people," we are inclined to rub our eyes and ask ourselves if the education of the community is really proceeding at the pace we sometimes like to believe. The assertions quoted above, however, were reported as made at the Association of Plumbers, Gasfitters and Steamfitters which recently met in Richmond, Va., and not at a convention of health officers or physicians.

It is hardly necessary to point out that typhoid fever—or any other fever—is not caused by bad smells, and that the small quantity of the gases of decomposition found in well-ventilated sewers has never been proved to exert any injurious effect whatever on health. A connection between plumbing and health has been shown to exist at just one point. Plumbing is of value to public health only so far as it removes human excreta from the immediate neighborhood of dwellings and so does away with the danger of fly-borne typhoid and other infection which arises from allowing infectious material to accumulate in family privy-vaults. Disease germs are not found in sewer air; indeed, it is difficult on physical grounds to see how they could get there. The "noxious gases and vapors," so dear to the plumber's imagination, are conspicuous by their absence in all perfectly constructed sewer systems, as every visitor to the great sewers of Paris and other modern cities well knows. "Defective plumbing" has about as much relation to public health as any other mechanical defect in house construction.

On the financial aspects of modern city plumbing ordinances we prefer not to dwell at this time. It is a well-recognized fact that these ordinances are drawn with no uniformity in our American cities and that what is required in one city may be prohibited in another. High authorities maintain that the system of

modern house plumbing which is made legally obligatory on housebuilders in many places entails a large, needless and altogether unjustifiable expense. Conceivably it is to the financial interest of plumbing supply houses—or somebody—to have the required system of plumbing as elaborate and as expensive as possible.

One feature of this situation deserves attention. It is plain that the most serious obstacle to the universal replacement in sewered towns of the dangerous privy-vault by the water-carriage system is the high cost of the plumbing. In this respect every unnecessary refinement and elaboration in plumbing outfits and legal requirements is a harm, not a help, to public health. The greatest possible simplicity and cheapness compatible with efficiency is what is needed in really "sanitary" plumbing, not a labyrinth of traps, vents and back-vents. If the plumbing interests really wish to aid the hygienic welfare of the community they can best do this, not by insisting on still more complicated devices and "inspections," but by simplifying and cheapening the cost of installing and maintaining the pipes and fixtures essential for carrying off the house wastes in a speedy and inoffensive manner. Finally, let us ask this question: To what extent do the plumbing ordinances in our American cities represent the prevailing opinion of public health experts and trained health officials, and to what extent do they represent the efforts of commercially interested individuals or organizations to entrench themselves behind the active if not always well-informed desire of the people to safeguard the public health?

MIXED VACCINE AND PHYLACOGENS

The noted advance in therapeutics shown in the development of vaccine therapy has brought with it grave dangers as well as advantages. We have, on a number of occasions, discussed in special articles and in editorials the dangers which threatened from the rapid commercialization of this new method. The unscientific character of mixed vaccines and of the mixed filtered products of a number of vaccines marketed as "Phylacogens" has been especially emphasized and the danger from their indiscriminate use pointed out. A little over a year ago we published a series of articles dealing with the whole subject in which the nature of mixed vaccines was described¹ as follows:

The mixed stock vaccine of commerce is a makeshift. It is offered as a substitute for correct diagnosis. Like all such makeshifts in science, it is doomed to failure. . . . A burden is being forced on the profession which will speedily assume the proportions attained by proprietary drug combinations. The menace cannot be counteracted unless physicians will accept the guidance of unselfish, non-commercial interests and refuse to purchase and use mixed commercial vaccines.

1. Bacterial Vaccine Therapy: Its Indications and Limitations, p. 37, reprinted from THE JOURNAL A. M. A., April 26-June 28, 1913, price, 19 cents.

This admonition to seek the guidance of unbiased scientific observers is deserving of special emphasis at the present time. Five weeks ago we published the address of the chairman of the Section on Pharmacology and Therapeutics, Dr. John F. Anderson,² one of our foremost workers in this branch of biologic science, in which attention was very forcibly drawn to the dangers involved in the use of biologic products of non-specific character. He says:

Bacterial therapy undoubtedly in some cases is a most valuable method of treatment; but when the claim is made that a combination of the dead bodies or the filtered products of a number of different bacteria are useful for the treatment of certain diseases with a different specific cause, it would seem that the suggestion closely approaches quackery.

Further he says:

Aside from the doubtful practice of the indiscriminate use of unproved methods of treatment, it has seemed to me that a great injustice is done the patient by their use, since some of the preparations that have been widely exploited have been shown to be harmful in certain instances and even to have caused death. So the first step in attempting to remedy conditions is to awaken the physician to the importance of ignoring the claims of those who are pushing these new methods until their usefulness and harmlessness has been clearly demonstrated by those best in a position to do so.

As a result of scientific methods in teaching therapeutics, physicians have gradually given up almost entirely the use of "shotgun" prescriptions and now prescribe a drug or a combination of one or two drugs, each given for the purpose of exerting a definite action. On the other hand, the purveyors of bacterial vaccines have gradually increased the number of different bacteria in their mixed vaccines until some of those now advertised for sale contain as many as seven different kinds of bacteria, and some of the "Phylacogens" contain the filtered products of at least eleven bacterial species!

Under the present federal law there does not seem to be any way in which the federal government can do more than is being done at present. It is a case in which the physician becomes the sole guardian of the patient committed to his care. He is the one and only responsible individual. He cannot throw the blame for bad results back to the manufacturer. When he subjects his patients to the possibility of harm by the use of these unscientific and dangerous preparations, the physician assumes the responsibility, whether he wants to or not.

If physicians would report their failures when these vaccines are used, and especially report the fatalities consequent on their use, with the name of the manufacturer of the particular product used, we are quite sure there would result a lessening in the enthusiasm of the purveyors of these products.

When tempted by the optimistic statements of the interested manufacturer of these mixtures to give them a trial the physician should remember that the

2. Anderson, John F.: Some Unhealthy Tendencies in Therapeutics, THE JOURNAL A. M. A., July 4, 1914, p. 1.

warnings of disinterested scientists are of far more value than uncritical clinical reports put out under commercial auspices.

This we quote from a recent book by Victor C. Vaughan,³ President of the American Medical Association:

Every time an unbroken protein is introduced into the body it carries with it, and as a part of it, a poison. From the very careless, rash, and unwarranted way in which "vaccines" of most diverse origin and composition are now used in the treatment of disease, this matter certainly cannot be understood or its danger appreciated by those who subject their patients to such risks. It should be clearly understood that all proteins contain a poisonous group—a substance which in a dose of 0.5 mg. injected intravenously kills a guinea-pig. This poison is present in all the so-called "vaccines" now so largely used, and it is not strange that death occasionally follows the use of "Phylacogen" or similar preparations. Not only do these proteins contain a poison, but when introduced parenterally the poison is set free, not in the stomach, from which it may be removed, but in the blood and tissues. It is possible that vaccine therapy may become of great service in the treatment of disease. Even now there are occasional brilliant results which are reported while the failures and disasters are not so widely advertised.

Such a warning as this quotation contains, from a man so eminent as Dr. Vaughan, merits and should receive the careful attention of medical men; at least it should have as much weight as the "clinical evidence" spread broadcast among our profession by commercial houses.

THE OPIUM ALKALOIDS AND DIABETES

Opium preparations have long been used in diabetes, and there is a wide-spread belief that they are frequently efficient in diminishing the excretion of sugar in this disease. Data might readily be cited from the literature of clinical medicine to show apparently advantageous results following opium medication. No satisfactory explanation has yet been furnished of the manner in which excretion of sugar is diminished. It has been suggested that the alleged beneficent influence of the drug is attributable in a general way to its well-known sedative action on the nervous system. This hypothesis contains, at least, something tangible, in view of the fact that more or less ill-defined conditions of nervous irritability have been said to produce certain types of diabetes. Now that the investigation of the sugar-content of the blood has assumed an importance as great as, if not greater than, the quantitative determination of the urinary sugar, the problem of the possible mode by which opium acts in this connection is presented anew. Dr. K. J. Otto af Klercker of the medical-chemical institute of the Swedish University in Lund has accordingly studied the influence of the opium alkaloids on certain forms of experimental hyperglycemia.¹ In the cases in which this

condition was elicited by injections of epinephrin or by the well-known *piqûre* experiment in which an injury to the roof of the fourth ventricle in the brain is promptly followed by glycosuria, no convincing effect attributable to the administration of opium products could be demonstrated. On the other hand, when an alimentary hyperglycemia was brought about by feeding unduly large quantities of glucose the inhibitory effects of opium products were clearly manifest. For example, repeated injections of opium alkaloids in quantities which of themselves had no demonstrable effect on the level of the sugar in the blood, nevertheless prevented the expected rise after the ingestion of sugar.

The newer studies of Magnus² and others have made clear certain effects of morphin on the movements of the alimentary tract which may serve to explain the inhibitory phenomena just referred to in connection with alimentary glycosuria. It is now known that this alkaloid greatly retards the discharge of its contents from the stomach into the small intestine, from which they are absorbed. It is apparent, therefore, that the antiglycosuric action of the opiates in diabetes may be due to the fact that the carbohydrates are not absorbed at the usual rate because they are not furnished in sufficient concentration through discharge from the pylorus. That the expected hyperglycemia does not develop in characteristic degree when opium products are administered may be due to the failure of the lower alimentary tract to be overloaded with readily absorbable carbohydrates within comparatively brief periods of time. Whether the facts here adduced will also suffice to explain the reduction in the output of sugar occasionally noted in human practice under similar therapeutic conditions, remains to be ascertained more definitely.

THE DANGER OF INFECTION FROM ICE

The modern practice of using iced food and drinks is so universal in this country that it is important to determine to what degree ice may be relied on as not carrying infection. When in the seventies and eighties of the last century it was shown that pathogenic bacteria might survive freezing, ice fell under suspicion as a possible medium for the transmission of disease; yet few epidemics have been ascribed to it, and the evidence concerning these has been regarded as inconclusive. H. S. Cumming¹ in a recent article makes a study from the point of view of the source of ice, the physical and biologic changes accompanying or consequent on its formation, and the methods employed in its collection or manufacture and handling.

3. Vaughan, Victor C.: Protein Split Products in Relation to Immunity and Disease, 1913, p. 236.

1. Klercker, K. J. Otto af: Untersuchungen über die Einwirkung der Opiumalkaloide auf gewisse Hyperglykämien, *Biochem. Ztschr.*, 1914, lxi, 11.

2. Morphin and Constipation, editorial, *THE JOURNAL A. M. A.*, May 31, 1913, p. 1711. Magnus: *Arch. f. d. ges. Physiol.*, 1908, cxxii, 210.

1. Cumming, H. S.: Safe Ice, *Pub. Health Rep.*, Aug. 7, 1914, p. 2066.

Ice is either natural or artificial. Until recently, in order to secure clean, transparent artificial ice, it was necessary to distil the water used; thus destroying all disease-germs present. With the newer methods employed, filtration is held to be sufficient. Cumming remarks that the fact, well known to chemists, that during crystallization nearly all extraneous substances are expelled from the crystal, was overlooked by sanitarians until recently. As Whipple says, "qualitatively the early bacteriologists were right; quantitatively they were wrong." In the formation of natural ice, most of the impurities are expelled into the waters of the pond or stream; and the same result is attained by the newer methods of artificial ice-making. By the "can" method, cans of water are immersed in the freezing mixture. As the freezing proceeds, the impurities are forced toward the center. In one of the newer methods, large cans are used, and the cakes of ice are cut into smaller ones, eliminating the dirty core. By another new "can" method, the impurities are expelled into about 6 inches of water kept liquid by agitation. In the "plate" method, the water is contained in large tanks, on one side of which are pipes containing the freezing mixture. The water freezes next the pipes in plates about 11 inches thick, and the impurities are expelled into the water beyond.

Some natural ice is undoubtedly derived from polluted rivers or ponds. Three great factors tend to purify ice from polluted waters: The first, as just mentioned, is crystallization. The second is temperature—the fact that freezing destroys a large percentage of bacteria. The third and most important is time. The longer the time intervening between the infection of water and its use (as water or as ice), the slighter the chance of the survival of the germs. On this score, natural ice, which is collected and stored for several months before shipment, has the advantage over artificial ice, which is usually marketed soon after it is made. Owing to these three factors—crystallization, temperature, time—clear, clean ice is of itself as free from danger as could be wished. Artificial ice made from pure water in clean, sanitary factories may be regarded as safe; so also may natural ice cut from reasonably pure deep ponds or lakes and stored under sanitary conditions. Artificial ice made from polluted water in dirty, insanitary factories is unsafe; natural ice cut from shallow polluted ponds or from grossly polluted rivers is also unsafe. Any dirty-appearing, cloudy ice may be infected as well as polluted; no such ice should be used in contact with food or drinks. Ice which is otherwise safe may become infected by improper handling—by being dragged across dirty streets or sidewalks or distributed by unclean hands. This is the great source of danger. We may practically eliminate danger by avoiding the handling of ice with dirty hands, by washing the ice with pure water, and by using only clear ice.

Current Comment

RADIUM IN CANCER

The papers on radium therapy in this and recent numbers of *THE JOURNAL*,¹ in addition to being instructive in themselves, are indicative of the interest in the subject at the present time. Radium therapy is going through the period of enthusiasm that Roentgen-ray therapy experienced ten years ago. This is perhaps inevitable, and after it the method will doubtless settle into its true place in therapeutics. It is not a new discovery that radium has interesting and useful possibilities. That was shown by Wickham and others several years ago. Indeed, we know enough from our experience now to predict with considerable assurance the extent of these possibilities. Radium is useful in numerous dermatoses; and, passing to the larger subject of cancer, it is indisputable that radium can be used successfully to destroy certain localized malignant growths, that is, growths on the surface whose entire extent can be sufficiently exposed to its energy. Extensive growths involving deep structures and disseminated growths are beyond its control, and there is no reason to believe that they will ever be brought within its control, for all experience with radium and the Roentgen rays has shown that these agents are useful in malignant growths only so far as they can directly destroy the cancerous tissue. In fact, there is every reason to believe that the extent and the limitations of therapeutic usefulness of the two agents are essentially the same, as are, indeed, the actinic energies of each. We have, then, a considerable experience on which to base our estimate of the usefulness of radium therapy, and from this experience there is no justification for the promise of relief in extensive cancer from the use of radium, or for the hope that with large quantities of radium we would be much nearer the solution of the problem of the cure of cancer in general than we are now. Radium has a useful therapeutic field, and it would be unfortunate for its therapeutic reputation to be damaged by exaggeration or injudicious enthusiasm.

A CURIOUS CUSTOM OF THE PARIS MEDICAL FACULTY

The historians of French medicine, Maurice Raynaud and others, have described at length the extraordinary amount of ceremonial (almost ritual) observances and banqueting which attended the graduation of Parisian medical students in the sixteenth and seventeenth centuries. Ernest Wickersheimer, librarian of the French Academy of Medicine, describes a singular custom of the old Paris Faculty

1. Tousey, Sinclair: A Case of Disseminated Carcinoma of the Breasts and Axillae Improved by Radium, *THE JOURNAL A. M. A.*, April 11, 1914, p. 1167. Clark, A. Schuyler: Radium Treatment of Cutaneous Epitheliomas by Single or Massive Doses, *ibid.*, May 9, 1914, p. 1453. Janeway, H. H.: Results of Radium in Cancer, *ibid.*, May 30, 1914, p. 1707. Kelly, H. A., and Burnam, C. F.: Radium in the Treatment of Uterine Hemorrhage and Fibroid Tumors, *ibid.*, Aug. 22, 1914, p. 622. Simpson, F. E.: Radium, Its Uses and Limitations in Skin Diseases, this issue, p. 737. Holding, A. F.: The Relative Value of Radium in Dermatology, this issue, p. 741. Newcomet, W. S.: Radium and the Roentgen Rays in Radiotherapy, *ibid.*, this issue, p. 743.

in the second half of the fifteenth century.¹ It seems that once a year, toward the end of winter, after the last elective disputation of the scholastic year, that is, at the beginning of Lent, the master regents of the Faculty betook themselves to the public warm baths at the expense of the bachelors in medicine. This observance is first mentioned by the historians of the Faculty, Feb. 27, 1473. It has been passed over by all other historians and was lost sight of in the seventeenth century. Jean Riolan, in his "Curious Researches on the Medical Schools of Paris and Montpellier" (1651), construing the Latin expression for the bath-house charges (*pro stuphis*) as an expense for stoves in the lecture rooms. The object of the custom was to afford a little recreation to the master regents, fatigued by the lengthy winter disputations, and of course, to make the festival complete, the visit to the baths was followed by a supper. In 1493, both bachelors and beadles were permitted to accompany the masters to the baths, and the same thing would have happened in 1499 had a bachelor not withdrawn, "an unbidden guest, because his bath bill had not been discharged." In February, 1496, it was still too cold for the Lenten tubbing; and in 1500, an epidemic of "inguinagra" (syphilitic bubo) was sufficient to scare the masters away from the baths, as happened in the case of the common bath pools of Germany in the same period. Wickersheimer states that this custom did not take root very deeply, and often the Faculty preferred to put the money obtained from the students *pro stuphis* to more practical uses. In 1479, the sum obtained was applied to the construction of schools; later, it was partly distributed among the master regents to liquidate the expenses of the banquets which always followed the disputations. From 1508 on, the amount collected was turned over to two master regents who had been designated as lecturers or readers (*lecteurs*).

AMERICAN VERSUS EUROPEAN POSTGRADUATE WORK

One of the compensations of the present European war is that it may compel Americans to seek out, to appreciate and to encourage a further development of the resources of their own country. Tourists who in other years sought the Swiss Alps will have time to see Colorado, California or Alaska; art patrons, deprived of the opportunity of buying dubious "old masters," will have a chance to do a real service to art by encouraging living native artists; students of music in the habit of studying abroad will be compelled to study at home, thereby bringing into prominence and encouraging better teaching in this country, and, last but not least, the multitude of physicians, compelled to break the habit of going to Paris, Berlin and Vienna for advanced medical instruction, may discover and call attention to the excellent facilities for postgraduate instruction in the United States. This is a good time to repeat what we have said before: that this country offers opportunities for postgraduate medical instruction equal to those afforded abroad, and some that are

superior, especially for American students. Foreigners have begun to appreciate the advances made in this country; we have had distinguished foreign visitors who came to learn, for instance, from American scientific work, hospital organization and surgery. It is true that, in the past, postgraduate instruction has not been so well organized in the United States as abroad. It has been said, also, to be rather expensive. Both of these objections are now being removed, with the organization of postgraduate instruction under university auspices in addition to other opportunities for postgraduate work. For instance, the Harvard Graduate School of Medicine offers for its summer term this year nearly two hundred different courses, including courses in all the numerous minor subdivisions of laboratory and clinical instruction. Tulane University, Louisiana, which also offers instruction to postgraduate students, is exceptionally situated in being able to give instruction in tropical diseases. Physicians whose plans for summer work have been deranged by the hostilities in Europe may have no reason to regret the enforced change if they employ their time wisely in America. On the whole, especially when the difference in the cost of travel is taken into consideration, a comparison of expense between American and foreign courses will be favorable to the former. Even before the present war broke out, it was acknowledged by men of high standing abroad that the future of medicine lies in America. It is to be hoped that one result of the interruption of communication between America and Europe may be that exaggerated prestige will no longer attach to one's having "studied abroad."

THE RADIO-ACTIVITY OF THE SARATOGA WATERS

In view of the fact that the sick of this and other countries have been extensively exploited in recent years by venders of so-called radio-active waters, the Bureau of Mines has done a public service by publishing the results of its examinations for radio-activity of the waters of Saratoga Springs, N. Y.¹ The results show that the activity of the different springs varies widely, some being more than twenty times as active as others. It is to be presumed that not even the most enthusiastic believers in the efficacy of radio-active waters would be inclined to attribute much remedial value to the radio-activity of even the strongest of them. Some are, however, much stronger in radio-activity than at least one of the widely exploited "radio-active" springs. Were the Saratoga Springs still in the hands of private individuals it is quite likely that these results would be exploited for commercial purposes. The work is stated to have been undertaken at the request of the commissioners of the state reservation at Saratoga Springs and, we assume, is published with their knowledge and consent. This procedure is far more creditable than that of the United States government in connection with the United States Reservation at Hot Springs, Ark.; the government has had the radio-activity of these waters

1. Wickersheimer, E.: *Gaz. d. eaux*, Paris, 1914, lvii, 751.

1. Moore, Richard B., and Whittemore, C. F.: *The Jour. Indust. and Engin. Chem.*, July, 1914, p. 552; abstr., *Propaganda for Reform Department*, this issue.

determined on two separate occasions, but only the vaguest and most meager information has been allowed to become public—just enough, in fact, to enable the bath-house owners and the government itself to exploit the results and to deceive the tens of thousands of sick who yearly visit these springs.

THE WAR AND THE MEDICAL PRESS

An evidence of one effect of the war is the small size of our British exchanges. This might be expected for no other reason than the lack of material for publication. The *British Medical Journal*, however, in its issue for August 15, gives as another reason the shortage of paper, which it states has become a very serious difficulty for the periodical press. The *British Medical Journal* has omitted entirely its epitome of current medical literature because it has received no German, Austrian or Russian exchanges for the previous two weeks, and very few from France. In addition to the difficulty in securing paper, because of irregular sailing of the ships, the consumption of paper by the newspapers has increased enormously because of the demand for extra editions. THE JOURNAL has received practically no German, Austrian or Russian publications, and but few French or Belgian periodicals since the war began. The Berlin Letter—mailed from Charlottenburg, July 31—arrived in Chicago August 25, too late for publication in this week's issue. No Paris and Vienna letters have been received of dates subsequent to the onset of hostilities.

Medical News

ILLINOIS

Still in Europe.—Drs. Frank J. Otis, Moline, and Dr. and Mrs. Karl F. Snyder, Freeport, are detained in Europe.

Personal.—Dr. Herman C. Stevens has been appointed examining alienist at Cook County Institution, Oak Forest. —Dr. Frederick W. Werner, Joliet, who has been critically ill with septicemia, is reported to be steadily improving.

Return from Abroad.—Drs. William L. Gray, Champaign; Heber Roberts, Belleville; Burdette E. LaDue, Ottawa; Ella Fitch Milligan, Ottawa; Mary L. Rosentiel, Freeport, and Charles B. Horrell, Galesburg, have returned from abroad.

Bathing Beach Closed.—The State Board of Health through its secretary, Dr. C. St. Clair Drake, has ordered closed the bathing beach for one-half mile on each side of one of the principal hotels at Fox Lake, Lake County. The sewage from the hotel empties into the lake near the beach and a number of cases of typhoid fever are believed to have been due to this cause.

Tuberculosis Notes.—The first clinic in the history of the Oak Forest Tuberculosis Sanatorium was held August 20 by Dr. Ethan Allen Gray in the Fresh Air Hospital. —Dr. Daniel Lichty, president of the Rockford Municipal Sanitarium to be located on a tract of land east of Sinnissippi Park, suggests the name of Oak Park for the institution. The site is about 15 acres in extent and 100 feet above the river with an ample forest area.

New Health Department Plans.—Tentative plans for the consolidation of several overlapping state bodies under the general title of the State Health Department, were considered at Springfield, August 19, at a conference of public health officials and others. The plans provide a state health department with a salaried health commissioner and an unpaid state board of health. The department is to include bureaus of vital statistics, foods, drugs, sanitary inspection, boards for the examination and licensing of physicians, pharmacists, dentists and nurses with power to revoke licenses

subject to review by the state board. The department is to be given sanitary control over barbers.

Chicago

Home from Europe.—Drs. Thomas J. Watkins and wife, Dr. Isaac J. Abt, Dr. Charles H. Solomon and Dr. Charles Gilbert Davis have returned from abroad.

Chicagoans Abroad.—Dr. Franklin H. Martin has reached London after an automobile trip from Munich. —Dr. Lloyd B. Crow, who has been studying in the Broussais Hospital, Paris, has gone to Fumay, a town on the French border near Namur and is caring for the wounded. —Dr. Robert J. Rize, with his wife and two children, has reached London after a trip through that portion of Belgium occupied by the German troops.

Personal.—Dr. Otto W. Lewke and daughter have returned from a tour of Alaska and the Canadian Rockies. —Dr. Harry M. Richter, who has just returned from Europe, delivered a lecture, August 21, in the amphitheater of the Maimonides Hospital on "Some Modern Advances of Medicine and Surgery," illustrated by stereopticon views. Similar gatherings are held at the hospital monthly, to which the medical profession is cordially invited.

Safety First Propaganda.—The coroner of Cook County has decided to issue the *Coroners' Safety Bulletin* weekly. The first issue deals with drowning and forecasts that one hundred and fifty-six persons will be drowned in Cook County during the year unless the educational campaign for public safety decreases this record. These figures are exclusive of suicides by drowning, of which twenty-two occurred last year. The greater part of the drownings reported to the coroner's office are during recreation or on picnics and the coroner urges that every child should be taught to swim and encouraged to enjoy it and that the sense of caution, prudence and calculation should be stimulated to the highest point for the maintenance of physical strength and alertness to overcome and escape danger, and the employment of judgment and alertness to avoid situations that are perilous to one's self and to others. This should include also training in first-aid, with special reference to drowning. The second bulletin is to be on accidental poisoning.

INDIANA

Loan to Health Board Authorized.—The city council of Indianapolis on July 28, authorized a temporary loan of \$77,000 for the use of the City Board of Health.

Indiana Physicians Abroad.—Dr. and Mrs. Franklin S. Crockett, Lafayette, Dr. Charles Melvin Mix, Muncie, and Dr. Manford M. Clapper, Hartford City, are detained in Europe on account of war conditions.

Home from Abroad.—Dr. and Mrs. G. Frank Holland, Bloomington; Drs. J. Rilus Eastman, William F. Clevenger and Thomas C. Hood, Indianapolis; Dr. Marcus Ravdin, Evansville; Dr. and Mrs. Harvey H. Martin, LaPorte, and Dr. Charles O. Bechtol, Marion, have returned from Europe.

Investigation of Insanity.—At a conference held in the office of the governor, August 7, the rapidly increasing number of insane, epileptics and other defectives in Indiana was discussed and the governor suggested the appointment of a commission to study the question, and stated that he would ask the legislature for authority to appoint such a commission.

State Association Meeting.—The annual meeting of the Indiana State Medical Association will be held at Lafayette, September 23 to 25. The sessions of the association will be held in the Y. M. C. A. Building and the Second Presbyterian Church. The Sunday before the meeting will be observed as "health day" and the pulpits of the city will be filled by members of the association.

Cause of Typhoid in Indianapolis.—The City Board of Health, Indianapolis, in investigating the typhoid situation in that city, found that fourteen cases were due to the careless handling of empty milk bottles. A family in which there was typhoid fever bought milk at the grocery and returned the empty bottles to the grocer, these were again filled by the dairy man and returned to customers, resulting in a large number of new cases.

Disease Prevention Day.—Arrangements are being made for the observance throughout the state of disease prevention day on October 2. Special emphasis is to be placed on the prevention of tuberculosis and representatives of the State Board of Health, Public Health Nurses' Association, State

Nurses' Association, State Medical Association, State Board of Education, State Society for the Prevention of Tuberculosis and State Federation of Clubs have been assigned positions on the initial committee of arrangements.

Society Incorporates.—The Indiana Society for the Prevention of Tuberculosis, filed articles of incorporation, July 28, in order to have legal authority to receive a bequest offered the society by an individual outside the state. The headquarters of the organization will be in Indianapolis and there will be a director for each congressional district of the state. The first board of directors is as follows: Mrs. George P. Decker, Evansville; Dr. Arthur A. Rang, Washington; Dr. Henry B. Shacklett, New Albany; Miss Mary Kennedy, Lawrenceburg; Prof. L. J. Rettger, Terre Haute; Dr. S. Edgar Bond, Richmond; Mrs. Jacquelin S. Holliday, Indianapolis; Miss Luella Anderson, Muncie; Dr. Fred A. Dennis, Crawfordsville; Dr. Otis B. Nesbit, Valparaiso; Mrs. E. W. Shirk, Peru; Dr. Eric A. Crull, Fort Wayne, and Dr. James A. Snapp, Goshen.

Personal.—Dr. Arvine E. Mazingo of the house staff of the Methodist Episcopal Hospital, Indianapolis, has been appointed to a similar position at the Metropolitan Hospital, Blackwell's Island, New York.—Dr. Darmon A. Rhinehart, instructor in anatomy in the Indiana University School of Medicine, Bloomington, has been appointed director of the anatomical department of the University of Arkansas, Little Rock.—Dr. Gilbert R. Finch, Center Point, was seriously injured by the overturning of his automobile, August 14.—Dr. Charles P. Hutchins, director of physical education at the Indiana University, Bloomington, has resigned and will practice in Rochester, N. Y.—Dr. Charles C. Morris, Rockville, has resigned the presidency of the Parke County Society for the Prevention of Tuberculosis.—Dr. Arnold Utterback, New Goshen, was painfully injured in an automobile accident, August 11.—Dr. Cassius E. Van Matre, Newcastle, is reported to be seriously ill with heart disease at his home.—Dr. Andrew W. Smith, Hammond, has been appointed director of athletics in Throop College, Pasadena, Cal.

KENTUCKY

Home from Europe.—Drs. John L. Phythian, Newport and John R. Murnan, Covington, reached home from Europe August 12.

Progress of Hookworm Campaign.—The State Board of Health reports that in the countries in which intensive health campaigns have been conducted under the auspices of the Board the doctors are on the lookout for intestinal parasites. They are certain that hookworm infection makes it practically impossible for the chronic diseases to get well on account of the decreased blood-supply. Of especial interest is the almost universal observation that, if uncinaria is diagnosed within the first few weeks of its first attack, except in the very severe cases, the patient usually recovers if promptly treated with thymol and this treatment is repeated at intervals of ten days until results are secured. Up to Jan. 1, last, the physicians of the state had reported the treatment of 45,470 cases of hookworm disease.

LOUISIANA

Lepers Discovered.—Four lepers were discovered in an isolated part of Arcadia Parish by Dr. Hines C. Webb recently and the unfortunate patients were sent to the State Leprosarium, White Castle.

Home from Europe.—Drs. Samuel M. D. Clark, Felix A. LaRue and Charles A. Borey, New Orleans, have returned from abroad.—Drs. Charles L. Chassaingnac, C. Jeff Miller, Gustav Mann and Otto Joachim, New Orleans, are reported to be still abroad.

Personal.—Dr. Andrew G. Friedrichs, for many years dean of the dental department of Tulane University, New Orleans, has resigned and has been succeeded by Dr. Wallace Wood, Jr.—Dr. Marcus J. Magruder, New Orleans, has been appointed a member of the board of administration of the Tulane University.—Dr. Joseph Conn, New Orleans, who was a passenger on the *Kronprinzessin Cecilie* on her memorable voyage, which ended at Bar Harbor, Maine, is sojourning at Clifton Springs, N. Y.—Dr. Isadore Dyer, dean of the Tulane Medical School, is taking a trip to Havana, Cuba.—Dr. Oscar Dowling, New Orleans, has been appointed chairman of the committee on vital resources of the National Conservation Congress.

Results of Hookworm Canvass and Campaign.—Dr. Sidney D. Porter, state director of the hookworm commission, has

issued a report of the two weeks' campaign in Tangipahoa Parish and the survey of the parishes of St. Helena, Washington, Livingston and St. Tammany. In the latter four parishes 5,397 microscopic examinations were made, and 52 per cent. found infected. In Tangipahoa 1,128 examinations were made, and 51.3 were found infected. In the preliminary campaign in the parish 1,228 patients were treated. No doubt is felt that insanitary conditions have caused the reinfection of many patients treated in the campaign three years ago. Since the inauguration of work in the state, 49 parishes have been surveyed and free dispensaries operated in 43, which has resulted in the treatment of 47,614 cases.

MASSACHUSETTS

Physicians Abroad.—Drs. Rufus A. Kingman and Calvin B. Faunce, Boston, have been detained in Europe by reason of the war.

Home from Europe.—Dr. and Mrs. Frank C. Granger, Randolph, Dr. George L. Richards, Fall River, and Dr. Fred B. Lund, Boston, have returned from Europe.

Physician Donates House for Hospital.—Dr. Charles S. Holden, Attleboro, has donated a summer home near Norton with the stipulation that it be used for a tuberculosis hospital for Attleboro.

Personal.—Drs. Sarah E. Coppinger, Needham Heights, and Thomas J. Scanlan, Boston, are the medical members of the board named by the governor to take charge of the Foxboro Hospital since its separation from the Norfolk State Hospital. At the first meeting of the board, Dr. Coppinger was elected secretary.—Dr. Charles F. McCaffrey, Somerville, has been appointed medical examiner of Middlesex County.

MINNESOTA

Home from Abroad.—Drs. Edwin Moren, Olaf J. Veline and Arthur E. Benjamin, Minneapolis; Dr. Louis A. Fritsche, New Ulm, Dr. Alfred E. Comstock, St. Paul and Dr. and Mrs. Edward W. Humphrey, Moorehead, have returned from abroad.

Minnesota Physicians Abroad.—Dr. and Mrs. Theodore L. Chapman and Dr. and Mrs. Robert Graham, Duluth; Dr. and Mrs. James L. Lynch, Winona, and Dr. John W. Lee, Minneapolis, are reported to be detained in Europe on account of war conditions.

Personal.—Dr. Thomas C. Clark, Stillwater, has been appointed chief surgeon of the Minnesota Soldiers' Home, Minnehaha Falls.—Dr. Arthur E. Benjamin has been appointed a member of the Minneapolis Board of Charities and Corrections.—Dr. William E. Harwood, Eveleth, has disposed of his hospital and will practice at his former home in Joliet, Ill.

Alleged Neglect in State Hospital.—On the recommendation of Dr. Henry M. Bracken, secretary of the State Board of Health, the governor has ordered an investigation of the State Hospital, Hastings, by the State Board of Visitors. Dr. Bracken's recommendation is said to be due to the failure of the hospital authorities to report cases of tuberculosis in the institution, although there were sixteen deaths from this cause in 1913, and there have been six deaths already this year from the same cause.

Southern Minnesota Physicians hold Summer Meeting.—The third summer meeting of the Southern Minnesota Medical Association was held in Winona, August 20 to 21 under the presidency of Dr. H. F. McGaughey. On the first evening, the association was entertained at dinner by the Winona County Medical Society and the medical profession of Winona. At this function, one hundred and thirty were present. At the first session, held after the banquet, Dr. William J. Mayo, Rochester, delivered an address on the "Influence of European Surgeons on American Practice" and Dr. Henry M. Bracken, Secretary of the State Board of Health, read a paper on preventive medicine. On the second day, a large number of papers were read and after luncheon, the members of the association were the guests of Drs. William J. and Charles H. Mayo, for an excursion on the steamer *Oronoco*. During the river trip, a session of the society was held.

Sanatorium Notes.—Representatives of Lincoln, Lyon, Pipestone, Murray, Cottonwood, Rock and Nobles counties, met in Tracy, August 8 to consider the establishment of a joint county tuberculosis sanatorium. A committee was appointed to examine three proposed sites, one at Lake Shatek, one near Windom and a third near Werthington.

MEDICAL NEWS

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Plans are being prepared for the Clay-Becker County Tuberculosis Sanatorium at Sand Beach Lake. The building is to cost \$25,000 and an additional sum of \$10,000 will be appropriated for the equipment of the heating plant, lighting system, etc.—A sanatorium is to be erected by Beltrami, Hubbard and Koochiching counties, to cost \$35,000; the building is to be erected at Bass Lake and the governing board is composed of seven members, three from Beltrami and two each from the other two counties.—Dr. Albert J. Chesley, Minneapolis, epidemiologist for the City State Board of Health has commenced a campaign of education and arguments to influence the county commissioners to take advantage of the state law for the erection of city-county tuberculosis sanatoriums.—It is announced that Goodhue County will erect a tuberculosis sanatorium on the shores of Lake Billsby, near Canon Falls.—The work on the sanatorium which was to have been built in Crookston, has been suspended because of the failure of the county commissioners of Polk County to make the one-mill levy, and the withdrawal of Norman County from the agreement.

Sedlacek, Omaha, has been appointed vice-chairman of the State Prison and Parole Boards.—Dr. Joseph F. Borghoff, Omaha, has been appointed a member of the staff of the St. Francis' Hospital, Butte, Mont.—Dr. George Tilden, formerly years head of the Douglas County Commission, has resigned and has been succeeded by Dr. Samuel K. Spalding.—Dr. Adam R. Ray, who has purchased a ranch near Brownlee, and is about to leave Fairfield, was the guest of honor at a dinner given recently by the Clay County Medical Association.

NEW YORK

New York Physicians Abroad.—Dr. and Mrs. Grant C. Madill and daughter, Ogdensburg, and Dr. Jane N. Baldwin, Poughkeepsie, are in London awaiting opportunity for passage to this country.

Personal.—Dr. Howard L. Van Winkle, Syracuse, is first on the list of eligibles to be certified by the State Civil Service Commission for permanent appointment as bacteriologist of Onondaga County.—Dr. C. Grace Carroll, who is temporarily filling the position, also passed the examination for this position.

The Carmody Drug Decision.—In an opinion handed down on August 19, Attorney General Carmody holds that the name of the physical purchaser of a habit-forming drug and not the person for whose use it is intended must be taken at the place of sale. He also states that a physician must not only write out a prescription when administering, but must do so when dispensing a habit-forming drug.

Course in Hygiene and Preventive Medicine.—Albany Medical College announces a special course in hygiene and preventive medicine which shall have special reference to the needs of the general practitioner, and in addition the State Department of Health has consented to deliver a series of twenty lectures on subjects related to hygiene and preventive medicine, especially on the relation of bacteriology to public health and the control of communicable disease. The special lecturers announced are Drs. Hermann M. Biggs, Linsly R. Williams, Augustus B. Wadsworth, Cressy L. Wilbur and C. E. A. Winslow.

New York City

Return from Europe.—Drs. Adolph Rostenberg and George David Stewart, Dr. Morris Manges, Dr. and Mrs. E. J. Bissell, Dr. and Mrs. Charles N. Dowd and Dr. Henry W. Frauenthal and Alfred A. Herzfeld have returned from Europe.

Typhoid on Hart's Island.—On August 12 a case of typhoid fever appeared in the workhouse on Hart's Island and on the 21st it is reported that there are twelve cases in the workhouse and two in the reformatory. The island has been isolated by order of the Board of Health and no prisoners will be permitted to leave for the present.

Physical Tests in the Health Department.—As attesting the good faith of his conviction that regular periodic physical examination of all employees is both practicable and advantageous, Dr. Sigmund S. Goldwater has himself submitted to a physical examination as have also 300 employees of the Health Department. Of this number 95 were found to have physical defects of more or less serious nature. It is believed that about the same proportion will be found to exist in any other body of employees.

OHIO

Home from Abroad.—Dr. John V. Gallagher, wife and four children, Cleveland, and Dr. and Mrs. Birt E. Garver, Loraine, have returned from Europe.

Bureau of Child Hygiene for Cleveland.—Dr. Clyde E. Ford, commissioner of public health, has asked for an appropriation of \$11,400 to establish a bureau of child hygiene, and has asked for a total increase of \$23,000 in his annual appropriation.

Trachoma.—The eye hospital in East Youngstown, started by Miss Mary Runyan and Mr. J. Clyde Campbell, is continuing to treat a number of trachoma cases which have been occurring in the various industrial plants of the city of Youngstown. The results so far have been good.

Antismall-pox Campaign at East Youngstown.—Vigorous measures are being taken in East Youngstown to combat the spread of small-pox. Every pupil will be vaccinated as soon as school reopens. The health officer, Dr. Amos B. Sherk, declares there is little real opposition to vaccination among the people.

MISSISSIPPI

Vaccines and Antitoxins.—At a recent meeting of the State Board of Health, it was voted to procure a supply of vaccines, antitoxins and serums to be distributed to the public at cost.

Personal.—Dr. Edward C. Parker, Gulfport, has returned from Europe.—Dr. L. S. Rogers, West, will take charge of the State Charity Hospital, Jackson, about September 1.—Dr. Edward R. Cook, Vicksburg, charged with manslaughter in connection with the death of Miss Rosa Grant, was executed July 25.—Dr. Rives A. Manker, Long Beach, has been adjudged insane and committed to the State Hospital.—Dr. Noel C. Womack, Jackson, has been appointed a member of the State Board of Health, vice Dr. Giles S. Bryan, Armory, resigned.

MISSOURI

City Rents Isolation Hospital.—The city of St. Joseph has rented at a cost of \$60 a month, the sanatorium of Dr. William L. Wittington at Twenty-Third and Sacramento Sts. The institution is to be used as an emergency hospital for communicable diseases.

From, to, and in Europe.—Dr. Clarence B. Francisco and Dr. Jabez N. Jackson, wife and daughter, Kansas City; Drs. Floyd H. Spencer, Joseph J. Bansch and Louis J. Dandurant, St. Joseph, have returned from Europe.—Dr. Alex Van Ravenswaay, Boonville, has returned to Holland for war service.—Dr. Evan S. Connell, J. Elliott Royer, Albert J. Welch and Joseph E. Sawtell, Kansas City, are awaiting an opportunity to sail for the United States.

St. Louis

Personal.—Dr. Keating Baudoy is reported to be ill in the State Hospital from an overdose of paraldehyde.—Drs. John F. Gallagher and R. Lee Dorsett have been appointed assistant police surgeons.

In and from Europe.—Drs. James C. Whitley, Harriet H. Stevens and Lionel S. Luton are detained in Europe on account of the war.—Drs. Frank Ring and Joseph L. Emil and Julius Boehm have returned from Europe.

Lung Clinic Open.—A clinic for diseases of the lungs has been established at St. Marys Dispensary, by the St. Louis Society for the Relief and Prevention of Tuberculosis and the St. Louis University. The clinic is in charge of Dr. Andrew C. Henske and is open from 12 to 1 o'clock on Mondays, Wednesdays and Fridays.

NEBRASKA

The State Association Meeting.—Dr. Joseph M. Aiken, Omaha, secretary of the Nebraska State Medical Association, announces that the next annual meeting will be held in Hastings, May 18-20, 1915.

Nebraskans in Europe.—Dr. Oscar S. Hoffman and wife, Omaha, reached London August 4.—Drs. George A. Stevens, Frank M. Conlin, William N. Anderson, Joseph M. Shramek, Omaha, who reached Paris on their way to Vienna, sailed from Liverpool for this country, August 15.—Dr. E. Willard Powell, Omaha, has returned from Europe.—Dr. Palmer Findlay, Omaha, sailed for home, August 23.

Personal.—Dr. E. Dolphus Haysmer, Washington, D. C., has accepted the position of surgeon and superintendent of the Nebraska Sanitarium, Hastings.—Dr. Frederick A.

Public Health Nurses.—Miss Bertha Bronson has been appointed public health nurse to the city of Lorain. Funds for this purpose were furnished by the city council.—Akron is to have a public health nurse, who will also act as health inspector. The expense will be borne by the Summit County Health Protective Society.

Public Health League Membership Increases.—A recent campaign and canvass started by the Urbana Public Health League resulted in the enrollment of 350 members. The total membership has now reached 554. Many organizations and lodges have sought membership and Urbana factories and stores are giving the league their moral and financial support.

Condemns City Prison.—The Board of Health of Circleville had declared the city prison unfit for use on many occasions because of unsanitary conditions therein, but nothing had been done to remedy the conditions. Finally, at its last meeting, the board prohibited the use of the prison. There are many other such prisons in Ohio requiring action by boards of health.

State Board Laboratory Moves to University.—In furtherance of Secretary E. F. McCampbell's plan to promote closer cooperation between the various state departments and the state university, the laboratory of the State Board of Health will occupy one of the buildings on the campus, at present being remodeled for its use. The laboratory, now situated in the Hartman Building, is being dismantled and set up in a building formerly used by the botany department at the university.

Personal.—Dr. William C. Mendenhall, Trotwood, who was struck by an electric car at Crown Point, August 13, is reported to be in a serious condition at St. Elizabeth's Hospital, Dayton.—The office of Dr. Eugene C. Beam, Columbus, was destroyed by fire, August 4.—Dr. Millard F. Hussey, Sidney, has been reappointed a member of the board of trustees of the Lima State Hospital.—Dr. Ernest Crockett, Ashtabula, has been elected coroner of Ashtabula County, vice Dr. Robert J. Baxter, Conneaut, resigned to become postmaster of the city.—Dr. Fremont M. Marshall, for three years health officer of Coshocton, has resigned.

PENNSYLVANIA

Personal.—Dr. Henry B. Burns has been appointed head of the department of school hygiene of Pittsburgh.—Dr. Wallace R. Hunter, Erie, has been reappointed trustee of the Warren State Hospital.—Dr. and Mrs. Schaffer, Allentown, have returned from Europe.

Reading Infant Mortality Reduced.—Through the efforts of the Visiting Nurses' Association of Reading, the mortality rate among infants in that city has been greatly lowered. The Fresh Air Home for Babies at Antietam, a few miles below the city and one of the many baby saving stations conducted by the association, has done much toward reducing the number of deaths of infants. Already more babies have been treated than last year when the total number in the care of the association reached 150.

Philadelphia

Hospital Superintendent Dies.—Rev. William Service Steen, for sixteen years superintendent of the Presbyterian Hospital, died August 12.

Care of Babies to Be Part of School Curriculum.—At the last meeting of the Board of Education, a motion was passed which made the teaching of methods to be employed in the care of babies a regular part of the work to be followed in the domestic economy course in the elementary schools. This subject will hereafter be taught in nine of the present housekeeping centers of the public schools and if successful the course will be extended throughout all grades of the elementary schools.

Personal.—Dr. Walter L. Pyle has sailed for South America.—Dr. William L. Rodman has returned from Europe and a number of others are reported to be on their way, among them Dr. E. E. Montgomery, on the *Adriatic*, which left Queenstown, August 21, and Dr. John H. Girvin, on the *Olympic*, which sailed from Liverpool, August 22.—Dr. Constantino N. Ciafardini, who has just returned from Italy, was the guest of honor at dinner given by his fellow countrymen of this city August 21.—Dr. Karl Schaffle of this city has been appointed deputy medical inspector of tuberculosis dispensaries succeeding Dr. Edward B. Shellenberger, Warren, resigned.—Dr. John E. B. Buckenham has been

appointed acting chief resident physician at the Hospital for Contagious Diseases during the absence of Dr. Samuel S. Woody on vacation.

VIRGINIA

Home from Abroad.—Drs. Israel Brown, W. Levi Old and Starke A. Sutton, Norfolk, have returned from Europe.

The Care of Infants.—The State Board of Health has issued 40,000 pamphlets on the care of infants, illustrated by photographs containing detailed directions for the care of infants and the general principles for the modification of milk.

State Health Board Appointments.—The governor has announced the following reappointments to the State Board of Health: first district, Dr. Samuel W. Hobson, Newport News; second district, Dr. Otto C. Wight, Jarratt; eighth district, Dr. William M. Smith, Alexandria.

Personal.—Dr. J. O. Fitzgerald has been elected bacteriologist to the State Board of Health with Dr. Gray as his assistant.—Drs. Charles M. Labenberg, Charles V. Carrington and Ramon D. Carcin have been appointed the new board of pension examining surgeons of Richmond.

Bacteriologist to Resign.—Mr. Aubrey H. Straus, for five years bacteriologist of Richmond, has announced that he will leave the service of the city at the end of the summer to become associate professor of bacteriology and preventive medicine in the University of Virginia, Charlottesville.

WISCONSIN

Sanatorium Plans Approved.—Plans for the Winnebago County Tuberculosis Sanatorium have been approved and advertisements for bids have been made.

New Health Insignia.—The city ambulance of Racine is now decorated by a gold star within a blue circle instead of the red cross which formerly designated the character of its work.

Detained in Europe.—Drs. John M. Dodd, Ashland; Charles W. Giesen, Superior; John Durner, Milwaukee, and Flora A. Read, Fond du Lac, are believed to be detained in Europe on account of war conditions.

Home from Abroad.—Drs. Thomas W. Nuzum and Edmund F. Woods, Janesville, have returned from Europe.—Dr. Albert M. Farrell, Two Rivers, reached New York, August 16.—Dr. Frederick A. Kraft, Milwaukee, returned from Europe, August 10.

Personal.—Dr. John W. Coon, Milwaukee, formerly superintendent of the City Tuberculosis Hospital, Wales, has been appointed superintendent of the new Municipal Tuberculosis Hospital, Chicago. Dr. Glenford L. Bellis, Wales, obtained the highest mark of the Cook County Civil Service examination, July 29, for health physicians at the Cook County Tuberculosis Hospital, Oak Forest.

GENERAL

Eye, Ear and Throat Specialists to Meet.—The annual meeting of the American Academy of Ophthalmology and Oto-Laryngology will be held in Boston, October 19 to 21.

Red Cross Offers Services.—The American National Red Cross has decided to offer its services to all nations involved in the European war. The secretary is at present in Europe and the international relief board is considering ways and means of rendering service. Ten hospital units each consisting of three surgeons and twelve nurses with complete equipment are said to be now ready to be sent to the European war zone.

The Plague at New Orleans.—Since the last report, two cases of provisional diagnosis, bacteriologically confirmed, of bubonic plague, have been made in the following cases: Case 18, Ching Sam, Mongolian, male, aged 72, residence, 911 Toulouse St., employed at the Chinese Restaurant, 916 Toulouse St., sick four or five days, found dead Aug. 16, 1914, diagnosis, septicemic plague. Case 19, Mary Hooper, colored, female, aged 40, residence, 1905 Bienville St., sickened August 14, removed to Isolation Hospital August 16, with right femoral bubo. Case 20, Louise Welsh (daughter of Mary Hooper), colored, female, aged 24, residence, 1905 Bienville St., sickened August 16 with left femoral bubo, removed to Isolation Hospital. Cases 55 to 64 of rodent plague have been reported up to August 22. During the week ended August 15, 101 vessels were fumigated; 12,705 pounds of sulphur were burned; 12,304 tons of outgoing freight were inspected; 21 clean bills of health and 7 foul bills of

health were issued in the outgoing quarantine department. In the department of overland freight inspection, 6,510 cars were inspected, 1,403 cars were rat-proofed, 5 cars were condemned and one rodent was killed in a car. The field operations for the week included 10,202 rats trapped; 33 premises fumigated; 57,955 poisons placed; 4,366 premises inspected; 1,624 notices served; 1,449 abatements and 117 dead inspected. At the laboratory 10,351 rodents were received and 9,001 examined. Of the rats, 37 were suspicious and in 17, the diagnosis of plague was confirmed. Since July 8, 44,135 rats have been examined.

CANADA

Canadian Surgeons for the Front.—While no official list of the Canadian Medical men attached to the militia has been published, it is understood that amongst others the following will be in the first Canadian contingent: Lt.-Colonel Duff in command; Dr. John L. Chabot, M.P., Ottawa; Hon. Dr. Henri S. Beland, N. Joseph, Que. and Drs. Perry G. Goldsmith and J. Harvey Todd, Toronto.

Infant Mortality in Canada.—With a little less than one-sixth the population of New York, Montreal heads the list in Canada in infant mortality. It has three times the mortality per 1,000 that New York has. Recent statistics places it at 290 per 1,000 births. Brandon comes next with 269; Ottawa, 256; Winnipeg, 169; Hamilton, 173; Halifax, 204; London, 164. By provinces the deaths per 1,000 births are as follows: Manitoba, 149; Ontario, 131; Saskatchewan, 130; Nova Scotia, 111; Prince Edward Island, 104. It is surprising to see the new western cities heading the list.

Hospital News.—The Vancouver General Hospital which has for the past seven years expended at least \$5,000 a year in the treatment of Hindus will make an attempt to collect this amount from some Hindu leader in that community, since the Hindus were able to raise \$14,000 to pay charter money for the steamer *Komagata Maru*.—The new St. Justine Hospital for Children was recently opened in Montreal. It contains eighty beds, three public wards, one private ward and a dispensary.—An Industrial Home for the Blind is in course of erection at Notre Dame de Grace, Montreal.—The Union National Française, Montreal, is to build a hospital at Maisonneuve.—The Bruchesi Institute at Montreal in 1913-1914 had 3,285 patients attend its clinics, the total number of consultations being 14,042. The number of deaths from tuberculosis registered in Montreal for that fiscal year was 1,083.

Health Items.—The death-rate in Toronto from typhoid fever in 1913 was 10.4 per 100,000 of the population. If the cases contracted outside the city were deducted, the rate would stand at 5.3. This would be the lowest rate of any American city, with a population over 350,000, outside of New York. In 1910 the death-rate stood at 40.8.—The new addition to the Toronto filtration plant on the Island is to have a capacity of 60 million gallons. It is to be of the mechanical type known as the Ver Merh drifting sand filter. Toronto will be the first city of large size to install this system and it is expected to be one of the finest and most modern filtration plants in the world.—The Department of Health, Toronto, has made a thorough survey of all factories and industries in that city—1,294 in all. In 80 per cent. the conditions are fairly good, but in the remaining 20 per cent. the conditions were such as to call for immediate action on the part of the Department.

Nova Scotia Provincial Sanatorium.—The Nova Scotia Government established the Provincial Sanatorium at Kentville in 1904. The ninth annual report of the medical superintendent, Dr. A. F. Miller, states that during the year ended Oct. 31, 1913, there were sixty-four applications for admission and that of these thirty-eight were accepted. At discharge twenty-three of these were apparently cured, eleven arrested, two improved, whilst two only failed to respond to treatment. It has been found that when tuberculin is used patients do better while in the sanatorium, but little ultimate benefit is apparent. Accurate records of all patients have been kept since January, 1910. Since that time ninety-four patients have been received for treatment. Fifty-nine of these are now well and working; nineteen are not working; fifteen are dead; the condition of only one remains unknown. There is great need in the province for hospitals for needy patients. A weekly fee of five dollars is charged and the balance for maintenance is supplied by the Government.

Infant Mortality in Toronto.—In June the Department of Health inaugurated a new branch of its service, known as the

Division of Child Hygiene with Drs. Alan Brown and George Campbell in charge. The appointments are in the hands of the professor of pediatrics in the University of Toronto and the Medical Officer of Health. Toronto now has a population of 510,000 of which 10,960 are under one year of age and 21,070 under two years. In 1897 the infant mortality totalled 664 when the population stood at 197,000. During the last five years it has been as follows: commencing with 1909—1,410; 1,420; 1,432; 1,584; 1,877. To care for the children in times of sickness there are the Hospital for Sick Children with 250 beds—baby wards, thirty cots. It has its own pasteurizing plant and supplies seven milk depots. The Infants' Home cared last year for 289, of whom 76 died during the year. St. Vincent's Home has an average of 100 cases in residence. The Haven, 61—nine died; The Sacred Heart Orphanage, inmates, 200. There are forty-two licensed baby farms. There are eight day nurseries, and numerous private organizations working for the infants. A floating sanatorium provides trips for about three hundred mothers and babies. The well-baby clinics number ten which will be increased to twenty-five in 1915.

LONDON LETTER

LONDON, Aug. 7, 1914.

The War: Medical Service

The greatest war which the world has ever seen has broken out suddenly and unexpectedly, yet there is every reason to think that the medical service of this country will be quite adequate for the work. Before the declaration, the navy, including its medical service, was completely mobilized. The medical officers of the reserve were called from their civilian duties. A number of surgeons have also been engaged for temporary service and senior students to act as dressers. Trained nurses have been called from a reserve organized by the matrons of the large hospitals for service in the naval base hospitals. Expert surgeons and anesthetists from the large hospitals are ready for duty as soon as the sick and wounded are landed from the hospital ships.

For the territorial force of the army, physicians have been called from civilian practice. Fourteen mounted brigade field ambulances, forty-two field ambulances and twenty-three general hospitals are available. Civilian physicians have responded to the call for service at home and abroad as temporary surgeons. Many private citizens have offered their residences for use as hospitals or convalescent homes.

THE CLINICAL CONGRESS OF THE SURGEONS OF NORTH AMERICA

(Concluded from page 697)

The Selection of Operation in the Treatment of Gastric and Duodenal Ulcers

Dr. A. von Eiselsberg said that symptoms of perforation of the ulcer into the general peritoneal cavity call for immediate operation, irrigation of the peritoneal cavity, closure of the perforation and in bad cases jejunostomy in addition for the purpose of administering nourishment. In the other complications of ulcer, such as hemorrhage, operation is in most cases better not done. In typical stenosis of the pylorus, especially when in the case of a long-standing ulcer no new symptoms have occurred, gastro-enterostomy is the operation to be chosen. Unilateral pylorus exclusion offers the greatest security in ulcer and its complications. For ulcer situated at a distance from the pylorus simple gastro-enterostomy is not so feasible as in cases of ulcer of the pylorus itself.

Hyperthyroidism

Dr. C. H. Mayo, Rochester, Minn., said that exophthalmic goiter is essentially a disease of a chronic character, presenting exacerbations and ameliorations of symptoms extending over a period of months or several years. The operative interference in cases resistant to treatment should be confined to injections of boiling water into the gland after Porter's plan to hasten improvement. In most of the severe cases a ligation is made first of the left upper pole only. Should the reaction following this be severe, the ligation of the right upper pole is indicated a week later, and thyroidectomy reserved until four months have elapsed, by which time these patients have made an average gain of 22 pounds, with great general improvement. However, if the reaction following the left ligation is not unduly severe, a partial thyroidectomy may be made at the second operation, the week following.

Typhoid Perforation

Dr. G. E. Armstrong, Montreal, pointed out the great difficulty in diagnosing. The first indication was usually pain, but it was absent in 25 per cent. of the cases. The symptom next in importance was change of expression, which was quite evident in the majority of the cases; 65 per cent. showed a definite alteration, 28 per cent. showed a gradual one, and 7 per cent. none. Tenderness was present in 88 per cent. and absent in 12. Rigidity was distinct in 85 per cent. and not in 15.

The Non-Operative Treatment of Carcinoma

Krönig of Freiburg was to have read a paper on this subject, but was recalled by the war. Dr. C. Jeff. Miller of New Orleans therefore gave his impressions of a visit to Krönig's clinic. He asked Krönig whether he was in favor of radiation treatment for early operable uterine tumors as well as for advanced cases, and was told that operation had been given up entirely. Roentgen-ray treatment was regarded as superior to hysterectomy for fibroids, though in women under 40 myomectomy was performed when feasible. Contrary to Bumm's statement that deep-seated tumors cannot be influenced by the Roentgen ray, Krönig believes that cancer of the stomach can be made to cicatrize, and even when there are secondary growths in the liver, retrogression can be brought about. Radium and thorium in large doses are also much employed by Krönig. He holds that large doses of radium strongly filtered have great possibilities in malignant disease in deep-seated organs. He uses large quantities of radium and thorium applied at a distance. For carcinoma of the cervix he does not apply radium through the vagina but from outside the abdomen. He does not believe in the implantation of radium into growths. Summing up, Dr. Miller said he was impressed by what he saw, but not convinced.

Dr. T. W. Eden of London admitted that the Roentgen rays were useful, but was less certain about radium. By the former a very beneficial effect may be produced though the disease may be advancing in the deeper tissues. The best promise of improved results is in the Roentgen rays combined with operation.

Mr. W. E. Miles of London never used radiant treatment but confined himself to operation. It is necessary to remove not only the organ affected but also the tissues through which spread has taken place and through which it will take place. In operating for uterine cancer the interiliac glands should always be removed whether obviously affected or not. If found infiltrated, the iliac glands should also be removed.

Dr. Joseph Bloodgood of Baltimore said that surgeons were so overwhelmed with the details of technic of extensive operations that they had not given sufficient attention to the beginnings of cancer. Cancer always gave warnings to its subjects and therefore a campaign of education should be undertaken. At the stage at which cases should be treated the mortality should be practically nil. Preventive treatment is all important, for cancer never develops in a healthy spot.

Marriages

LUCIUS P. BECK, M.D., Piedras Negras, Mex., to Miss Minnie E. Stephens of San Antonio, Tex., at Uvalde, Tex., August 3.

ISAIAH E. LAWRENCE, M.D., to Miss Grace Vivian Coyle, both of Columbia City, Ind., at Detroit, Mich., August 11.

GEORGE CHAUNCEY WRIGLEY, JR., M.D., to Miss Marie A. Timm, both of Dixon, Cal., August 8, in Sacramento, Cal.

JOSEPH DANIEL HEITGER, M.D., Bedford, Ind., to Miss Katherine Georgina Everbach of Louisville, Ky., July 15.

EDWARD LEWIS TEED, M.D., Lis'le, N. Y., to Miss Nettie Knoeller of Hallstead, Pa., at Syracuse, N. Y., August 6.

WILLIAM DEHART FITZHUGH, M.D., Doe Hill, Va., to Miss Bessie May Wagner of Monterey, Va., June 30.

RALPH HOMER BOICE, M.D., to Miss Mabel Chatterdon, both of Sistersville, W. Va., August 12.

JOHN ROBERT WHITE, M.D., Lynn, Mass., to Miss Margaret E. Hale of New Haven, Conn., July 21.

JOSEPH HAROLD FRIEDMAN, M.D., to Miss Sarah Margulies, both of Brooklyn, N. Y., August 9.

Deaths

Eugene Alfred Smith, M.D. University of Buffalo, N. Y., 1887; a Fellow of the American Medical Association; adjunct professor of clinical surgery in his Alma Mater; attending surgeon at Buffalo Hospital and assistant at Charity Hospital; consulting surgeon to the German Deaconess, Riverside and Woman's hospitals; once major and surgeon of the 65th Infantry, N. G., N. Y.; for many years a practitioner of Buffalo; died at his home in Saranac Lake, N. Y., August 9, from tuberculosis, aged 49.

William G. Ralston, M.D. Medical College of Evansville, Ind., 1873; a practitioner of Indiana since 1845; surgeon of the Eighty-First Indiana Volunteer Infantry and later secretary of the enrollment board of the First Indiana District during the Civil War; later surgeon of the U. S. Marine Hospital at Evansville; a member of the Mississippi Valley Medical Association; said to have been the oldest practitioner of Indiana; died at his home in Evansville, August 11, aged 95.

Wesley Harris Sharp, M.D. University of Pennsylvania, Philadelphia, 1865; a Fellow of the American Medical Association and a charter member of the West Virginia State Medical Society; hospital steward in the Navy during the Civil War; one of the oldest and most respected physicians of West Virginia; died at his home in Parkersburg, August 5, from uremia, aged 71.

Edgar B. Smith, M.D. Detroit College of Medicine, 1887; a Fellow of the American Medical Association; professor of surgery in the Michigan College of Medicine and Surgery, Detroit; surgeon in chief of the Boulevard Sanitarium, Detroit; died at his home, August 11, from septicemia due to an operation wound received three weeks before, aged 52.

Wallace B. Amick, M.D. Hospital College of Medicine, Louisville, Ky., 1898; of Glenalum, W. Va.; a Fellow of the American Medical Association; physician to the Glenalum Coal and Coke Co.; while traveling on a railway velocipede with the paymaster of the company; was shot and killed by robbers, August 14, aged 39.

Edward P. Childe (license, Nebraska, 1891); for fifty-three years, and until 1913 a practitioner of Nebraska; a veteran of the Sioux and Blackfeet campaigns; for one term a member of the Territorial Legislature of Nebraska; died at his home in Seattle, Wash., recently, after a surgical operation, aged 78.

William Andrew Forster, M.D. Homeopathic Medical College of Missouri, St. Louis, 1888; professor of surgery in the Kansas City Hahnemann Medical College; for twenty-five years a resident of Kansas City, Mo.; died in Grace Hospital in that city, August 8, after a surgical operation, aged 58.

Liston Homer Montgomery, M.D. Northwestern University Medical School, Chicago, 1871; a Fellow of the American Medical Association; a veteran of the Civil War; secretary of the Ohio Society of Chicago; died at his home in that city, August 24, from cerebral hemorrhage, aged 66.

John Lazelle Sawyers, M.D. Northwestern University Medical School, Chicago, 1878; of Centerville, Iowa; a Fellow of the American Medical Association; died in Augustana Hospital, Chicago, August 10, ten days after an operation for appendicitis, aged 58.

George G. Graham, M.D. College of Physicians and Surgeons, Baltimore, Md., 1882; formerly an alienist of Pittsburgh, and a member of the staff of Dixmont Hospital for the Insane; died at his home in Santa Barbara, Cal., August 9, from heart disease.

Nathan Cash, M.D. College of Physicians and Surgeons, Keokuk, Iowa, 1865; a veteran of the Civil War and for nearly forty years a practitioner of Uhrichsville, Ohio; died at his home in that city, August 12, from cerebral hemorrhage, aged 74.

James P. Cox, M.D. Northwestern University Medical School, Chicago, 1904; of Jefferson, Wis.; a member of the Wisconsin State Medical Society; died at St. Mary's Hospital, Milwaukee, August 12, after an operation for appendicitis, aged 38.

John C. Hallam, M.D. Marion-Sims College of Medicine, St. Louis, 1899; a Fellow of the American Medical Association; for several years a practitioner of St. Louis; died at his old home in Centralia, Ill., August 13, aged 38.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

The Radio-Activity of the Waters of Saratoga Springs

The article by Richard B. Moore and C. F. Wittemore (*Jour. Indust. and Engin. Chem.*, July, 1914, p. 552), quotations from which are given below, is of special interest in view of the general confusion of ideas with regard to radio-active waters. The work described was done by these authors for the Bureau of Mines at the request of the commissioners of the state reservation at Saratoga Springs, New York, in order to determine to what extent the waters and gases evolved from them were radio-active. THE JOURNAL comments on the work editorially elsewhere.

"The work done involved the direct testing of the gases evolved from the springs for thorium and radium emanation; the examination of the waters: (a) for their total activity; (b) of a certain number for the activity due to dissolved radium salts; and the determination of the activity of the residues deposited by the springs, where such residues could be obtained.

"The activity of any water may be due to the presence of (a) dissolved thorium or radium emanations, (b) dissolved thorium and radium salts. All mineral and deep well waters are more or less radio-active, but the activity is usually due to the presence of dissolved radium emanation, not to dissolved radium salts. Therefore, the fact that a water is radio-active has of itself little significance. . . . [Italics ours.—Ed.]

"Tests on the activity of the evolved gases were made on the ground in the following manner: A glass funnel to which was attached a rubber tube connecting with a small rubber bulb in turn connected with one of the openings to an electroscope, was inverted over the spring at a point where the evolution of gas was greatest. By pressing the bulb, a continuous and fairly constant supply of the gases from the spring was passed through the electroscope. By stopping the flow of gas and immediately making a series of readings across the scale, each reading being of short duration, it was possible to ascertain whether the activity was entirely due to the presence of radium emanation. If thorium emanation was present, a very sudden drop in activity would be noticed and, after a few minutes, the curve obtained by plotting activity against time would flatten out, due to the decay of the thorium emanation. In no case was thorium emanation found in any of the gases evolved from the springs, the activity being entirely due to the presence of radium emanation.

In order to get the activity of the waters, samples which previously had been collected at the springs at a point nearest to the source of supply, were boiled in the apparatus designed by Schlundt and Moore¹ and the evolved gases containing the radium emanation were introduced into a standardized electroscope. "On account of the large amount of carbon dioxide contained in some of the waters it was found advisable to add a sufficient amount of C.P. sodium hydroxid before boiling. In order to differentiate between the activity due to radium salts in solution and that due to dissolved emanation, samples of some of the waters were treated with C.P. hydrochloric acid, boiled for fifteen minutes and then sealed in flasks and allowed to stand for a month. At the end of this period they were boiled in the usual way and from activity obtained it was possible to calculate the amount of radium salts in solution.

"Samples of deposits from some of the springs were also collected and fused with sodium carbonate according to the method of Strutt.²

"Column 2 in the table of results gives the activity per liter at standard temperature and pressure, of the gases evolved by the springs; Column 3 gives the total activity per liter of the water, and Column 4 the activity per liter of the

water due to dissolved radium. Column 5 shows the activity of the material deposited either in or just around the outlet of the spring.

	Tempera- ture ° C	Gas Radium per Liter Gram $\times 10^{-11}$	Water Radium per Liter Gram $\times 10^{-11}$	Deposit Radium per gram Gram $\times 10^{-11}$	
Spring	1	2	3	4	5
Emperor	9.7	22.1	7.0	6.8	....
Peerless	...	...	6.0	...	....
New red	10.0	8.0	4.3	...	....
Hathorn No. 1.....	10.2	21.3	14.2	4.2	76.9
Coesa	10.2	8.1	9.7	...	7.9
Hathorn No. 2	10.0	5.1	16.1	9.9	....
Hathorn No. 3	9.5	8.3	6.6	...	12.0
Geyser	9.7	3.4	3.9	...	1.7
Adams	11.0	11.7	12.2	5.1	8.8
Flat No. 2	10.5	3.7	5.0	...	6.5
Pump well No. 4.....	12.0	67.8	23.1	2.1	6.3
Island	...	...	11.8	...	10.5
Crystal Rock	10.0	84.7	88.0	0.9	....
New Shouts well.....	...	...	11.3	...	....

" . . . The fact that the residues are radio-active shows that the waters contain dissolved radium salts in addition to dissolved emanation, but this fact is more precisely indicated by the results under Column 4. . . .

"The total activity of the waters is rather low, although that of the Crystal Rock spring is considerably above the average. The activity of this spring, however, is not exceptional.

"Since these analyses were made, the hydrostatic level of the waters at Saratoga Springs has distinctly changed, owing to the cessation of the extensive pumping for commercial purposes which formerly took place. Accordingly, the flow of many of the wells has increased. Whether this has also affected the radio-activity of the water cannot be predicted with certainty."

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

WHAT CONSTITUTES FIRST AID?

To the Editor:—We are having a controversy with a liability company as to what constitutes first aid in fracture cases. We maintain that this includes the reposition of the fracture and the x-ray pictures necessary for its successful reduction. The liability company says that radiographs cannot be included in first aid. Our attorney tells us that there has been no ruling on that point in this state. Please tell us the ruling in Illinois or adjoining state or advise us in any other way on this point (What constitutes first aid?), as we are inclined to make a test case of this rather than accept the niggardly offer of the liability company.

T. J. BILLION, M.D., Sioux Falls, S. Dak.

ANSWER.—What constitutes "first aid" is a question of considerable importance owing to the great increase of accident and liability insurance. So far as we are aware no judicial decision has been handed down defining "first aid"; but a brief reference to the manner in which the term came into general use will aid one in arriving at a clear understanding of the scope of its meaning. When a person is accidentally injured or suddenly taken ill it is perfectly natural for those about him to render any aid or assistance within their knowledge and power. The humanitarian principle underlying such service has been long recognized and has inspired the formation of societies of laymen, the members of which receive a certain amount of instruction in order that they may be better able to render such service in an emergency. These societies are usually called first-aid societies, the idea being to give aid pending the arrival of a physician or surgeon.

The importance of doing something to relieve the injured, and particularly in the case of wounds to protect them from infection as much as possible, has caused most industries, railroads, etc., to provide first-aid outfits and to have certain of the men instructed in giving first aid until the patient can be turned over to a physician, or can be removed to a settled place such as his home or a hospital. There can be no question that the service thus rendered by laymen in such emergencies is "first aid"; but now suppose the one nearest at hand to the injured is a physician, or suppose that some one with no other authority than that of trying to do something to aid one in trouble summons a physician. Does the physician give "first aid," and if so, what is included in "first

1. Schlundt and Moore: *Jour. Phys. Chem.*, 1905, ix, 320.

2. Strutt: *Proc. Roy. Soc.*, 1906, (A), lxxvii 472.

Book Notices

THE SENSORY AND MOTOR DISORDERS OF THE HEART. Their Nature and Treatment. By Alexander Morison, M.D., F.R.C.P., Senior Physician to the Great Northern Central Hospital, London. Cloth. Price, \$2.50 net. Pp. 261, with 51 illustrations. New York: William Wood & Co., 1914.

This volume is an earnest and dignified effort to set forth the importance of considering the nervous mechanism of the heart when attempting to understand the working of this organ in health or disease. Morison believes that the myogenists have been overenthusiastic in their claims. Not only does the ordinary muscle of the heart show nervous structures, but such specialized areas as the sinu-auricular node, Tawara's node, the bundle of His, and the wall of the coronary arteries are rich in nervous tissue whose function must surely be reckoned with. He is also not convinced that the atrioventricular node and bundle are purely vestigial remains of embryonic tissue; he believes that they have participated in the progressive development of the heart, growing and exercising their own special functions. His study of angina pectoris has led him to the belief that its causes may be various. He refuses to commit himself to any single theory of angina pectoris. The condition of the blood, of the nerves, the vessels, the muscle, may all be contributing factors. In fact, he believes that in many instances there are operating several causes constituting a "compound angina pectoris." So he is able to agree with those who regard the cause of the stenocardiac attacks as due to coronary obstruction, coronary spasm of the heart-muscle and stretching of the muscle from dilatation, and with those also who regard the pain as neuritic, neuralgic, aortic, etc. His discussion of the prognosis and treatment is clear and sane. He is evidently not inclined to use digitalis in angina so freely as some others, who, it seems to us, are in the right. There is a brief consideration of some of the disturbances of cardiac rhythm. This gives Morison another opportunity to emphasize the importance of the nerve-control of the heart. He also reveals his skeptical attitude toward some of the more recent views in cardiology. For instance, he doubts the usual interpretation of auricular fibrillation. The tachy-arrhythmia of the ventricle may be the cause and not the effect of the perverted auricular action (pp. 182, 222, etc.). He discusses heart-block enough to let one know that he thinks there are some things about it that are not yet proved. Altogether the book is an interesting contribution to the literature of heart-disease. The results of Morison's clinical experience are here set forth as well as epitomes of numerous post-mortem examinations in instructive cases that he has studied during life. From each one of these cases the author tries to draw some lesson bearing on the anatomy, physiology or pathology of the heart, and such studies are always of value. Morison is—to use a political expression—a stand-patter, a reactionary. He fights shy of the electrocardiograph and interpretations based on it. The older methods are good enough for him. We enjoy his well-worded thrusts at the progressive cardiologist, and must acknowledge that some of them strike home; but at the same time we feel that the sum total of his criticism, sincere as it is, is rather in the direction of retarding than advancing a knowledge of the truth.

DIE LOKALISATION IM GROSSHIRN UND DER ABBAU DER FUNKTION DURCH KORTIKALE HERDE. Von Dr. Med. C. v. Monakow, Professor der Neurologie, Universität in Zürich. Paper. Price, 48 marks. Pp. 1033, with 270 illustrations. Wiesbaden: J. F. Bergmann, 1914.

In this book the author of the well-known classic on *Gehirnpathologie* gathers together his scattered writings on brain localization and functional disturbances caused by lesions of the brain cortex, and molds them into a homogeneous whole. We can safely predict that the book is destined to become a source of inspiration to all who are interested in any branch of neurologic science. The author begins with general remarks on the symptomatology of lesions in the brain cortex, and points out that the initial symptoms of a

lesion limited in extent are often entirely out of proportion to the amount of tissue involved, but seem to originate in centers remote from the seat of the lesion. This phenomenon as well as the gradual or rapid subsidence of many of the symptoms he believes to be due to the so-called process of "diaschisis," in support of which theory this book was written. By the term "diaschisis" Monakow means essentially "that shock-like cessation of function in nerve-centers widely separated in location but physiologically related in some manner and usually functioning synchronously with the center in which the lesion has occurred." He thus explains the multififormity of symptoms following a lesion in a known brain area and the gradual recession of many of the symptoms: diaschisis having passed off, there remain only the symptoms actually caused by the anatomic change in the brain. Monakow is thoroughly convinced that his theory will account not only for the many hitherto unexplained phenomena which follow a lesion of the brain, but also for the restitution of certain lost functions. He does not accept the assumption of "vicarious and compensatory action of parts of the brain not disabled for those unable to carry on their work." To him this theory is not supported by facts. Likewise he doubts the existence of strictly circumscribed physiologic brain territories. With the exception of the most elementary processes in the sensory sphere, there is to him a physiologic overlapping of most of the brain functions. In the subsequent chapters the author reviews the experimental and clinical work on the localization of motion, sensation and the special senses, as well as the interesting and yet obscure topics of agnosia, apraxia and aphasia. Everywhere he finds lacunae which only diaschisis is able to fill. Whether diaschisis is the true explanation and will cover the many hiatuses in our knowledge of cerebral localization, or whether some other theory will take its place, it is a pleasure to follow the author through a thousand pages of highly scientific and critically well-digested material. Monakow has again given to the profession a monumental work, the like of which is to be found in no other language; apart from its controversial character, it gives the best summary of cerebral localization with which we are acquainted. The bibliography alone contains 3,174 references.

THE PRACTICE OF PEDIATRICS. By Charles Gilmore Kerley, Professor of Diseases of Children in the New York Polyclinic Medical School and Hospital. Cloth. Price, \$6 net. Pp. 878, with 139 illustrations. Philadelphia: W. B. Saunders Company, 1914.

This book is not merely a new edition of Dr. Kerley's "Treatment of Diseases of Children"; it is a comprehensive text-book on diseases of children. Dr. Kerley's students will appreciate his book. In addition to being an excellent text-book, it has that direct personal appeal of the clinical teacher of large experience. The book is not simply a compilation, but every page reflects the personal opinion of the author. This makes it peculiarly positive and practical when coming from a clinician of such large and varied experience. The book can be recommended safely to the student, but even more to the practitioner, as a conservative, sane, up-to-date, practical treatise on pediatrics that easily takes its place among the two or three best American text-books on that subject. The chapter on vaccine therapy is up to date but conservative, and those especially interested in gymnastic therapeutics will find forty pages devoted to that subject.

IMMUNITY: METHODS OF DIAGNOSIS AND THERAPY AND THEIR PRACTICAL APPLICATION. By Dr. Julius Citron, Assistant at the University Clinic of Berlin. Translated from the German and Edited by A. L. Garbat, M.D., Assistant Pathologist, German Hospital. New York. Second Edition. Cloth. Price, \$3.50 net. Pp. 267, with 40 illustrations. Philadelphia: P. Blakiston's Son & Co., 1914.

This edition of Citron's well-known manual on immunity will undoubtedly prove even more popular than the first. The subject-matter has been brought thoroughly up-to-date through valuable additions made by the editor. In these days the subject of immunity and immunologic reactions has become so extensive that the general worker may hope for little beyond a slight knowledge of this field. Books like this

present the material in such a clear-cut and concise manner that the more important phases of the work may be grasped in a short time. Moreover, this book gives such attention to detail of technic that one may become qualified to perform the usual tests applied to such investigations. It is not to be supposed, however, that the mere mastering of technic will make a specialist in such work. Citron, as well as many others, emphasizes the fact that careful study of the variations arising in different tests as well as of the methods of proper control of all tests must be made before one is able to attempt the proper interpretation of his tests. Care and precision in each test made as well as an enormous experience along lines of serum diagnosis are necessary for the worker in this field. The subject-matter embraces both theoretical and practical discussions, the latter being limited to methods used in the clinic for diagnostic, therapeutic or prophylactic purposes. Citron's wide experience enables him to point out the various details of the tests so clearly that little excuse is given for improper technic. This book may be commended to the general and even special worker as, probably, the clearest and most practical exposition of this important field of research at our disposal.

LE LABORATOIRE DU PRACTICIEN. Analyse Clinique—Méthodes et Procédés. Guide de Diagnostic et D'Hygiène Prophylactique des Maladies Communes Exotiques et Tropicales. Par Paul Gaston, Chef du Laboratoire Central et de Radiologie de L'Hôpital Saint-Louis. Third Edition. Paper. Price, 4 francs. Pp. 140, with 319 illustrations. Paris: A. Poinat, 1914.

With the appearance of the third number, Gaston completes his admirable discussion of the value and limitations of the physician's laboratory. As Gaston has previously pointed out, the general worker should not only be in a position to perform a large portion of his own laboratory work but, especially, must also have sufficient knowledge of theory and technic to enable him properly to interpret the findings of others. The proper fittings and equipment as well as the more important methods to be used have been the points taken up in this little manual. This number deals, in a clear and concise manner, with the chemical and microscopic examination of the urine; study of colloids and crystalloids; investigation of normal and pathologic secretions and excretions; examination of feces; methods of histology and pathology, and serodiagnosis, especially as applied to the study of agglutination and complement fixation. It is not to be supposed that the methods have received extensive elaboration, as this is not the purpose of the work. Enough is given, however, to enable one to become familiar with the best methods of study of a given problem. The illustrations are numerous and, for the most part, adequate. This manual is to be commended to those who may wish a brief work covering the more important phases of the rather extensive and important field of clinical diagnosis.

PAIN: ITS ORIGIN, CONDUCTION, PERCEPTION AND DIAGNOSTIC SIGNIFICANCE. By Richard J. Behan, M.D. Cloth. Price, \$6. Pp. 920, with 191 illustrations. New York: D. Appleton & Co., 1914.

The first 140 pages of this book treat of pain in the abstract. Here the author discusses the perception, nature, distribution and intensity of pain and its relation to other sensations. He has made an exhaustive study of the literature on the related subjects from which he often quotes: He is somewhat dogmatic at times, but this makes the subject-matter clearer than if he expressed the conflicting views of the literature. The remainder and greater part of the book discusses the pains which are peculiar to special organs, as the appendix; and to special regions, as pains in the back or head. The author pays particular attention to differential diagnosis of pain and has a number of well-arranged tables on diagnosis. The value of the work is considerably enhanced by many excellent illustrations and diagnostic charts. The book should prove valuable to the general practitioner, both as a reference book for the particular case and for a careful study of the whole subject. There is a well-arranged bibliography whereby those who wish to consult the original literature may be able to do so.

LECTURES ON DIETETICS. By Max Einhorn, Professor of Medicine at the New York Post-Graduate Medical School and Hospital. Cloth. Price, \$1 net. Pp. 155, with 4 illustrations. New York: Paul B. Hoeber, 1914.

The author has undertaken to produce his lectures from the stenographer's notes without revision. The result is a certain familiarity of style that makes the topic interesting. The book deals in principles rather than in detailed facts, and is marked by strong common sense and conservatism. The principle is laid down that the strong man when acutely sick does not need food, although the nutritive needs of the aged and of poorly nourished persons should be kept in mind. In chronic diseases, on the other hand, the need of nutriment should be met by sufficient food even if other forms of treatment are interfered with and some symptoms are temporarily made worse. Therefore the author feeds the patient in chronic diarrhea even if some nourishment is lost by the increased number of bowel movements. Some tables and descriptions of special diets supply data for application to individual cases. The book tends to remove the arithmetical aspects of dietetics and place it on the high ground of rational therapeutics. We bespeak for it a cordial reception by the profession at large, for its subject appeals to every practitioner rather than to any specialist.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALBERTA: Edmonton, September 15. Registrar, Dr. Cecil E. Race, University of Alberta, Edmonton.

IOWA: Des Moines, September 10-12. Sec., Dr. Guilford H. Sumner, Capitol Bldg., Des Moines.

MASSACHUSETTS: Boston, September 8-10. Sec., Dr. Walter P. Bowers, State House, Boston.

MISSOURI: Kansas City, September 28-30. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.

NEW YORK: September 22-25. Chief of Examination Division, Mr. Harlan H. Horner, Department of Education, Albany.

West Virginia April Report

Dr. S. L. Jepson, secretary of the West Virginia State Board of Health, reports the oral and written examination held at Charleston, April 21-23, 1914. The number of subjects examined in was 10; total number of questions asked 100; percentage required to pass was 80. The total number of candidates examined was 16, including one osteopath, of whom 14 passed, including one osteopath, and 2 failed. Fifteen candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
George Washington University	(1913)	87	
Howard University	(1912)	85.7	
College of Phys. and Surgs., Baltimore	(1913) 89.2, 90, 91.8,	92.3.	
Maryland Medical College	(1912) 83.4;	(1913) 88.2	
Leonard Medical School	(1911)	83	
Starling-Ohio Medical College	(1913)	81.2	
Woman's Medical College of Pennsylvania	(1907)	86.6	
University College of Medicine, Richmond	(1913) 81.4,	86	
FAILED			
Leonard Medical School	(1911)	78.4	
Meharry Medical College	(1912)	75.3	

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Atlanta College of Phys. and Surgs.	(1912)	Tennessee
Rush Medical College	(1912)	Illinois
University of Louisville	(1911)	Kentucky
College of Phys. and Surgs., Baltimore	(1904)	Maryland
Maryland Medical College	(1912)	Maryland
Medical College of Ohio	(1898)	Ohio
Starling Medical College	(1887)	Ohio
Starling-Ohio Medical College	(1911)	Ohio
University of Wooster, Med. Dept.	(1890)	Ohio
Jefferson Medical College	(1908) Pennsylvania;	Illinois
Woman's Medical College of Pennsylvania	(1910)	Penn.
Chattanooga Medical College	(1910)	Tennessee
Univer. Coll. of Med., Richmond	(1900) Virginia;	Virginia

Miscellany

Supervisory Medical Officers in Germany

In Germany provision is made for a supervisory medical service in charge of district physicians known as *Kreisärzte*. Consul H. W. Harris at Frankfort, in *Daily Consular and Trade Reports*, June 9, 1914, describes the manner of appointment and duties of these medical officials. They are appointed by the state and are under the supervision of the state authorities in the various provinces. They may be called on to cooperate with local health authorities, mine and factory inspectors, federal insurance officers and others. Their duties embrace not only matters for the prevention of disease, but also duties which under American practice belong to coroners, medical examiners, boards of health, mine inspectors, undertakers, etc. In combating infectious diseases the local authorities must render assistance in carrying out the district physician's proposals. He is charged with the duty of maintaining intimate relations with private medical practitioners of his district for promoting knowledge about medical matters, medical societies, etc., and in making investigation in regard to outbreaks of infectious diseases he must consult with the private physicians who have cases under treatment. This applies to meningitis, lockjaw, child-bed fever, typhoid, diarrhea, relapsing fever, hydrophobia, glanders, trichinosis, meat- and fish-poisoning, snake-bite, etc., as well as to the usual infectious diseases. He must watch over general health conditions and see to the enforcement of the laws and regulations in regard to health, apothecaries, hospitals, other health institutions, midwives, etc. He is required to keep a record of all physicians, medical assistants, dentists, midwives, apothecaries and druggists with their clerks and apprentices, and must also keep a personal record of the status of every practitioner in his district, and must make it his particular task in conjunction with the medical practitioners of his district to warn in a proper way against the injurious doings of quacks, and must keep a watchful eye on persons who practice the healing art without permission and who assume titles in this connection to which they are not entitled. With the aid of the police he keeps a biographical record of quacks and illegal practitioners. He also inspects drug-stores, dispensaries and similar establishments, inspects the books and sees that illegal fees are not charged for prescriptions. He also keeps especial surveillance over midwives and their practice, and examines and passes on the fitness of persons who wish to practice midwifery. Besides these duties, specific instructions are given to district physicians in regard to housing, factory and hygienic conditions of the people, and on many other subjects. He is the medical authority to whom are to be referred all matters pertaining to the hygienic welfare of the people of his district. He may be employed full time on salary, in which instance he is not allowed to do private practice, or he may be on salary and fees, when he may be allowed to practice. In addition to the very modest salary, certain allowances are made for house-rent, office, care-taking, etc. Leave of absence for rest or on account of sickness is allowable each year, and after ten years of service as district physician, if incapacitated he is granted a pension for life.

Fly Larvae and Horse Manure

The Department of Agriculture has been conducting experiments to find a method of destroying flies by chemical treatment of horse manure (*Bull.* 118, Dept. Agric., July 14, 1914). Of the twenty-four chemicals tested, the best results were obtained from borax and calcined colemanite or crude calcium borate, which showed a larvicidal power of over 99 per cent. in nearly all trials. Borax not only kills the larvae but also prevents the eggs from hatching; calcined colemanite acts on the larvae alone. The minimum effective amount is 0.62 pound of borax and 0.75 pound of calcined colemanite with the addition of 2 or 3 gallons of water to 8 bushels (10

cubic feet) of manure, which will destroy practically all the fly maggots. In these small quantities the borax did not interfere with the normal fermentation of the manure. Since boron in large quantities inhibits the growth of plants, tests were also made to determine if the borax-treated manure exerted any such deleterious effect. Tests on tomatoes, peas, beets, radishes, kohlrabi, oats, corn, cucumbers, lettuce, apple seedlings and rosebushes were negative with the amounts of borax mentioned. Wheat appeared to suffer a temporary setback under heavy applications of borax. The department issues the warning that borax-treated manure has not been studied in connection with the growth of all crops, nor has its cumulative effect been studied. It recommends that not more than 15 tons per acre of borax-treated manure should be used, and that not over 0.62 pound of borax be employed for each 8 bushels of manure. The suggestion is made that borax be applied to floors and crevices in barns, stables, markets, etc., and to street sweepings, and water added as in the treatment of horse manure. Borax, which costs about 10 cents a pound at retail, may be had at 5 or 6 cents a pound in 100-pound lots; calcined colemanite sells for about 2 cents a pound in large shipments, and for about 4 cents a pound in smaller quantities. The department figures that the cost of borax treatment will be about 1 cent per horse per day, and that of treatment with calcined colemanite considerably less.

Training the Left Hand

Some time ago the development of left-handedness in children was warmly advocated by various persons not only because in this way reliance could be placed on both upper extremities for mechanical work, which would undoubtedly be of advantage in case of serious disturbance of the functions of the right arm, but also because the hope was entertained that by training the left arm, a second speech center might develop in the right hemisphere of the brain in the same way as the well-developed right arm corresponds with the speech center placed in the left half of the brain. The Berlin physician, M. Fränkel, was especially active in the advocacy of this plan; in fact, experiments in this direction were undertaken in various localities. The practical results which have been so far reported do not correspond in any degree to the optimistic expectations of the advocates of the method.

In 1911, Dr. Schäfer, on the basis of permission granted by the school deputation, collected statistics with reference to left-handedness among about 18,000 pupils of the Berlin public schools. These statistics show that 4.06 per cent. of all the children are left-handed, 5.15 per cent. of all the boys and 2.98 per cent. of the girls. The percentage of children in whom both hands are equally developed is very small, being only 0.21 per cent. The overwhelming majority, 95.73 per cent. of all children, are distinctly right-handed. In several school districts, among 448 teachers there were ten who were left-handed. L. Katscher's work on "Training the Left Hand" (*Die Ausbildung der linken Hand*) was the theoretical basis for the exercises to train the left hand. They included exercises in writing, arithmetic, manual training and gymnastics; especially in the last two systematic efforts were made. In general, the result showed that the possibility of employing the hitherto unused left hand at first excited great joy and marked interest, but the physical awkwardness generally was a great hindrance. This was particularly shown in writing, in which the mirror-writing and scrawling crows' tracks diminished the success of the instruction. In drawing, the success was relatively greater, especially when the drawings were made on the blackboard; also in manual training good results were obtained in building, plaiting and weaving. In gymnastics the special exercises such as bending the fingers, the hand and the left arm produced an increasing aptitude and skill.

The experiment was tried in 145 classes. Children to the number of 2,611 (1,497 boys and 1,114 girls) undertook these left-handed exercises. They were given up in three cases; in one class because the teacher was ill, in two others because these exercises were regarded as useless, time-consuming in

carrying out the instructions laid down by the school board, and a hindrance.

The outcome of the whole experiment shows that in no case could a preference for the left hand be developed. It may be trained to be a welcome assistant to the right hand, but never as a substitute for it. In teaching writing the complaint is made of a destruction of the esthetic sense and a deterioration of the hand writing. The children refused to write with the left hand, became nervous and worried over it, and increased intellectual development was in no case observed. Almost all those who gave an opinion were unanimous that the advantages stood in no relation to the expenditure of time, pains and patience.

Old Age Pensions in Denmark

For twenty years Denmark has had laws providing for old age pensions. Prof. Katherine Coman gives in the *Survey* the history of this legislation and its working, together with a statement of opinion as to the law, derived from an inquiry in that country concerning it. The pension is granted to persons over 60 years of age, either men or women, who are found to be worthy and in need. An unmarried woman is subject to the same conditions as a man. Wives, widows or divorced women are entitled to a pension equivalent to that which would have been awarded to the husbands. The amount of the pension is not fixed by law, but is left to be determined in each case. An attempt has been made in some communities to standardize the amount of the pension. This applies practically only to Copenhagen and Fredericksborg. A maximum pension was fixed, which differs for men and women, married couples and couples with children in the places mentioned above. A maximum is also fixed for other towns and the rural districts. The tendency has been for the amount granted to be increased from year to year, although the amounts are still very low, estimated on the basis of the cost of living in a country like the United States. These pensions seem to be becoming a heavy burden on the taxpayers of the communes and on the state treasury, which has assumed half of the expenditure.

In 1895 the average annual pension in Denmark cities, was 72.59 kroner (a krone is about 27 cents). In 1906 and 1907, the average had increased to 118.69 kroner. In 1892, the total number of beneficiaries under this pension law was 43,826. In 1911 it had increased to 79,289. The total expenditure had increased from 2,500,000 kroner in 1892 to 13,000,000 in 1912 and 1913. In an investigation of this form of provision for old age, it was found that the sums expended for poor relief outside the pension law have also increased. An inquiry by Professor Coman as to whether this amount was not regarded as a new form of poor relief, was answered by every one from taxpayer to administrator in the negative, though there were differences of opinion as to the desirability of such a law. Professor Coman states that there is no question that the economic injustice of leaving the workingmen in a condition in which they are liable to suffer from actual want or requiring them to accept poor relief has been satisfactorily terminated, and heavy burdens have been lifted from children, relatives and benevolent employers. The rapid increase on the demands on the public treasury, however, have startled even the best friends of the measure, and already modifications of the law have been suggested whereby workingmen are to be required to contribute, during their working years, to the fund for their later relief. Another plan suggested has been to standardize the pensions of the towns and rural districts, as in the case of the city of Copenhagen, in order that the amount of expenditure required be more certain than under the present arrangement. It has been proposed to reduce the number of beneficiaries by lowering the age limit to 65. It may not be easy to do this, since every laborer has a general practitioner, both of whom belong to the Social Democratic party. It is a well-arranged bibliography of the surplus which the employer consults the original literature.

Medicolegal

Malpractice in Treatment of Gunshot Wound

(*Dailey vs. Shaffer* (Mich.), 146 N. W. R. 192)

The Supreme Court of Michigan affirms a judgment against the defendant for malpractice while treating the plaintiff's husband for a gunshot wound in the calf of his right leg. The court says that the shot tore its way clear through the thick part of the calf, leaving a hole large enough to insert two fingers. The man was removed to his house, and the defendant arrived within a few minutes thereafter and took charge of the case. The wound was partially cleansed and some of the foreign matter removed, after which antiseptic gauze was inserted, and the leg was bandaged. Strychnin tablets were administered, as the patient was suffering from shock and loss of blood. After giving members of the family some instructions as to treatment during his absence, he left at about 11 a. m., after having been there an hour, and returned at 3 p. m., to find the patient somewhat improved. At this time, he remained about fifteen minutes. On the first visit, the defendant made some investigation to learn the extent of the injury, but did not go far enough with it to learn whether any of the arteries had been severed or punctured. On the second visit, he made no investigation in this respect. At 7 p. m. it was thought that the patient was bleeding too freely, and repeated attempts were made to reach the defendant over the phone, but without avail. At 4 a. m. next day, the condition became alarming, and a neighbor was dispatched for the defendant, but before he arrived the patient was dead. A post-mortem examination disclosed the facts that the posterior tibial artery was cut off and the popliteal artery was partially divided, and experts gave it as their opinion that the patient died from arterial hemorrhage. The negligence with which the defendant was charged was: First, a failure to ligate the severed and injured arteries; second, in failing to visit and attend to the patient as often and as much as he should have done. The defendant admitted that he did not inform himself as to whether the arteries were cut off or punctured, and it was shown by expert witnesses that he should have done so; that he should have found the bleeding point and stopped the hemorrhage. After he determined what course to pursue without this information, he was in no position, as a matter of law, to invoke the protection of the rule in emergency cases, but it was properly submitted to the jury to determine whether he did what was necessary to bring his treatment within the rule in emergency cases, that if a physician exercises his best judgment as to the treatment, he is not liable for negligence for an error of judgment in following one treatment rather than another. The other ground of complaint, as to whether the defendant gave the patient the attention and care which the case demanded, was likewise one for the jury.

Practice of Medicine by Chiropractor

(*People vs. Ellis* (N. Y.), 147 N. Y. Supp. 681)

The Supreme Court of New York, Appellate Division, Second Department, affirms a conviction of the defendant of the misdemeanor of practicing medicine within that state without any license or registration. The court says that the defendant claimed to be a chiropractor or doctor of chiropractic. He had a sign with regular office hours, and as a witness he admitted having treated about 200 persons for ailments of the stomach, chest, or spine, also for nervousness, hysteria, and diseases coming from pressure on the nerves. The prosecution proved by a witness whom the defendant had treated that the defendant first examined her ankle, pronounced the arch as having fallen, massaged the foot, and advised a different shoe. On a further visit he manipulated the patient's spine, which, speaking as a spinologist, he pronounced out of alignment in several places. He said he could restore it, but it probably would not stay the first time. He further gave the opinion that the nerves lead-

ing to the ankle might be so impinged on as to cut off the circulation. In view of the large increase of those who attempt remedies without drugs or instruments, legislatures in this and other states have found it necessary to deal with all who assume to treat or prescribe for physical ailments. The defendant's office-sign, circular and professional card, as well as his own frank admissions as a witness, all showed that he held himself out as able to diagnose, treat, and prescribe for pain, disease and injury. Rubbing and pressure on the human joints are old therapeutic agents. When accompanied by such attempts at diagnosis as the statement that a patient's pains in the ankle were caused by the spine, having come out of alignment through displaced vertebrae, the defendant's acts came within the statutory definition of the practice of medicine. He therefore was guilty of the misdemeanor of practicing medicine without a license, or being registered under the public-health law, Section 174. The information which charged practicing medicine without lawful authority between certain dates, and in particular on five days which it specified, was sufficient. The different acts going on to establish the unlawful practice need not be more particularly set forth in the information, as they simply made up one continuous offense.

Attending Physician Versus Experts on Mental Condition

(*Philpott et al. vs. Jones et al. (Ia.)*, 146 N. W. R. 859)

The Supreme Court of Iowa holds that in this case, in which the probating of a will was being contested on the ground that the maker lacked testamentary capacity, an instruction was properly refused which would have told the jury that "the attending physician is presumed to know the state of the mind of his patient, and these are facts that should be considered by the jury in determining the weight that should be given to their testimony." There is no presumption that a physician who is called to treat a sick man for his physical ailments, is better qualified to testify as to the mental condition of the patient, from the mere fact of attendance on his physical sickness, than is one who is trained to the treatment and who has large experience in the treatment of mental diseases. Besides, the weight to be given to the testimony of a witness depends on too many things to justify the court in limiting its probative force to one particular fact. The condition of the human mind at any stage of human existence is difficult of proof; perhaps the most difficult of any with which courts and juries are compelled to deal. Mental unsoundness, whether resulting from old age or physical sickness, is so various in its character and so different in its manifestations that it is often difficult for the most experienced experts, after most careful and thorough investigation, to trace it to any sufficient cause or to define its extent or its effect on the conduct of the individual. Even the most experienced alienists, with all the facts before them touching the conduct of the individual concerning whose mental condition the investigation is instituted, are often found widely differing in their conclusions as to the then condition of the mind under consideration. Mental unsoundness may exist which would render a man incompetent to make a will, notwithstanding to all outward appearances he seems to be sane to those with whom he comes in casual contact, who are not experts on the question.

Entitled to Recover Expenses and Compensation

(*Plumb vs. York County (Neb.)*, 146 N. W. R. 938)

The Supreme Court of Nebraska holds that a regularly licensed physician, who is paid a salary of \$5 per month for his professional services in treating the inmates of the county poor-farm and the county jail, may recover from the county the actual expenses incurred by him in quarantining, fumigating, and suppressing an epidemic of small-pox within his county, together with a reasonable compensation for his services. The court says that it appeared that the plaintiff was called on by the county to attend, quarantine, and fumigate in 132 cases of small-pox. His actual expense in connection with this service was \$260, and he charged the county \$726

for his professional services in that behalf. The county board disallowed his claim, and he prosecuted an appeal to the District Court. The cause was tried without a jury and the Court awarded him a judgment for \$790.35. The county sought to defeat his claim by contending that he was a member of the board of health, and therefore he could not have a return of the money expended by him in the suppression of the disease, and neither could he have compensation for his services rendered in that behalf. Moreover, it appeared that there was no contract entered into between the county and the plaintiff for the services in question, and there was a rule that required members of the board of health to serve without compensation. If the contention of the county was to prevail, however, then the public would be helpless to protect itself against contagious and epidemic diseases. It is easy to understand why the members of the board of health should receive no compensation for serving thereon, but it would be difficult to understand why a physician should be called on to serve the county in suppressing an epidemic and contagious disease without compensation. Many cases were cited to support the contention that an officer must perform all the duties of the office for the compensation provided by law, but those cases were not decisive of this controversy. The plaintiff was entitled to recover the expenses actually incurred and paid by him in the suppression of the small-pox epidemic in question, together with a reasonable compensation for his professional services. The judgment of the District Court was right, and it is therefore affirmed.

On Prohibiting the Use of Tobacco

(*City of Zion vs. Behrens (Ill.)*, 104 N. E. R. 836)

The Supreme Court of Illinois holds void, as an unreasonable interference with the private rights of the citizen, a city ordinance making it unlawful for any person to smoke tobacco in any form, or to have in his possession, any lighted pipe, cigar or cigarette, in or on any street, alley, avenue, boulevard, park, parkway, public passageway, depot, depot platform, depot grounds, hospice, hotel, store, post-office, or other public building or public place within the city. The court says that, recognizing that tobacco smoke is offensive to many persons, and in exceptional cases harmful to some, the court has no doubt that power exists to prohibit smoking in certain public places, such as street-cars, theaters and like places where large numbers of persons are crowded together in a small space. But this is quite a different matter from prohibiting smoking on the open streets and in the parks of a city, where the conditions would counteract any harmful results. The personal liberty of the citizen cannot be interfered with unless the restraint is reasonably necessary to promote the public welfare. In the broad language in which this ordinance was enacted it was apparently an attempt on the part of the municipality to regulate and control the habits and practices of the citizen without any reasonable basis for so doing.

Entitled to Show Who Employed Physician

(*Egner vs. Curtis, Towle & Paine Co. (Neb.)*, 146 N. W. R. 1032)

The Supreme Court of Nebraska says that it appeared that, after the plaintiff was injured, a physician, unknown to, and without authority from him, was called to treat his injuries, and, without any subsequent employment by him, continued to treat him for a considerable period of time. On the trial of the action which he brought against his employer to recover for his injuries, his counsel called the physician to the witness stand and attempted to show by him who employed him. That was not misconduct on the part of counsel. If, as a matter of fact, the physician was the physician of an insurance company that had contracted to indemnify the employer for injuries to its employees, and, by reason of that fact, was called to treat the plaintiff after his injury, the plaintiff had a right to show the fact as a circumstance tending to show that the defendant recognized a liability. If some insurance company was defending the case under the cover of the defendant's name, it was proper to uncover it.

Society Proceedings

COMING MEETINGS

- Amer. Assn. of Obstetricians and Gynecologists, Buffalo, Sept. 15-17.
 American Association of Railway Surgeons, Chicago, Oct. 14-16.
 American Electro-Therapeutic Association, Battle Creek, Sept. 15-17.
 American Roentgen Ray Society, Cleveland, Sept. 9-12.
 Association of Military Surgeons of the U. S., Cincinnati, Sept. 29-Oct. 2.
 Colorado State Medical Society, Boulder, Sept. 8-10.
 Delaware State Medical Society, Wilmington, Oct. 13-14.
 Idaho State Medical Association, Boise, Oct. 8-9.
 Indiana State Medical Association, Lafayette, Sept. 24-25.
 Kentucky State Medical Association, Newport, Sept. 23-25.
 Med. Soc. of the Mo. Valley, Des Moines and Colfax, Ia., Sept. 17-19.
 Michigan State Medical Society, Lansing, Sept. 11-12.
 Minnesota State Medical Association, St. Paul, Sept. 30, Oct. 1-2.
 Nevada State Medical Association, Reno, Oct. 13-15.
 New Mexico Medical Society, Albuquerque, Oct. 5-7.
 Oregon State Medical Association, Portland, Sept. 10-11.
 Pennsylvania State Medical Society, Pittsburgh, Sept. 21-24.
 Utah State Medical Association, Salt Lake City, Sept. 29-30.
 Vermont State Medical Society, Rutland, Oct. 8-9.
 Washington State Medical Association, North Yakima, Sept. 21-23.
 Wisconsin State Medical Society, Oshkosh, Oct. 7-9.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Public Health, Boston

July, II, No. 7, pp. 555-632

- 1 Conservation of Vision. F. Allport, Chicago.
- 2 Collection of Municipal Waste. W. F. Morse, New York.
- 3 Advantages and Disadvantages of Day and Night Collection of Municipal Waste. W. H. Edwards, New York.
- 4 Recoverable Values of Municipal Waste. G. H. Norton, Buffalo.
- 5 Cost of Incineration. P. M. Hall, Minneapolis.

Annals of Surgery, Philadelphia

July, LX, No. 1, pp. 1-136

- 6 *Experimental Operations on Orifices of Heart. A. Carrel, New York.
- 7 *Bronchiectasis. W. Meyer, New York.
- 8 *Surgical Aspects of Bronchiectasis. J. G. Mumford and S. Robinson, Clifton Springs, N. Y.
- 9 Choice of Anesthetic in Operating for Abscess of Lung. F. T. Murphy, St. Louis.
- 10 *Results of Conservative Treatment of Cystic Disease of Breast. R. B. Greenough and C. C. Simmons, Boston.
- 11 Two-Stage Operation Especially in Its Relation to Treatment of Cancer. G. W. Crile, Cleveland.
- 12 *Arteriovenous Anastomosis of Femoral Vessels for Impending Gangrene. Report of Sixteen Cases. C. Goodman, New York.
- 13 *Melanoblastomas of Foot (Chromatophoroma, Melanoma, Melanosarcoma). Report of Ten Cases. A. E. Hertzler and E. T. Gibson, Kansas City, Mo.

6. Experimental Operations on Orifices of Heart.—Also published in *The Journal of Experimental Medicine*, July, 1914, and abstracted in *THE JOURNAL*, August 1, p. 428.

7. Bronchiectasis.—It is generally recognized, says Meyer, that a somewhat advanced, viz., a well developed, bronchiectasis is a surgical and not a medical disease. The operative treatment should be considered from the following points of view: *A.* Pneumotomy for draining the suppurating cavities. *B.* Operations done to compress the lung (collapse therapy). (1) By creating therapeutic pneumothorax—nitrogen insufflation; (2) pneumolysis with or without introduction of a tissue filling; (3) thoracoplasty, combines with, or without (4) phrenicotomy. *C.* Operations done to influence the pulmonary parenchyma, producing contracting plus carnification. (1) Transposition of the lung; (2) ligation of branches of the pulmonary artery, with or without subsequent thoracoplasty, pneumolysis and phrenicotomy—intrapericardial ligation of the first divisions of the pulmonary artery. *D.* Amputation of the diseased lung.

8. Surgical Aspects of Bronchiectasis.—The following points are emphasized by Mumford and Robinson. Granted that bronchiectasis is commonly the result of bronchial obstruction by foreign body, tumor or disease, the first indication in therapy should be the removal, if possible, of this

obstruction. Bronchoscopy for the removal of a foreign body has not infrequently arrested bronchiectasis. In the earlier stages of bronchiectasis, nitrogen gas injection producing artificial pneumothorax is indicated, and should always be tried.

Pleuropneumolysis, or extensive rib resection, is a dangerous procedure, with additional dangers in bronchiectasis. It should be employed only when adherent pleura prevents the introduction of nitrogen gas. Even then it is a dangerous procedure, and one of doubtful value. In late cases of bronchiectasis, when the disease is obviously confined to one lobe, lung resection is the sole hope of surgical cure. The attempt at lung resection at a one-stage operation has been attended with high mortality. Occasional successes do not prove that the one-stage amputation will become the method of choice. The authors hold that for the time being, at least, the general surgeon should first produce compression of the lung by artificial pneumothorax or pulmonary arterial ligation; second, and much later, he should excise. Meanwhile the student of thoracic surgery will develop the one-stage excision.

10. Conservative Treatment of Cystic Disease of Breast.—

Eighty-three cases in which cystic disease was present have been investigated by Greenough and Simmons and proved by pathologic examination of the tissue removed at operation, but all were cases in which only a partial removal of the diseased gland tissue was performed. The subsequent incidence of carcinoma in these cases, therefore, gives a further light on the tendency toward its development in cystic disease of the breast. In 14 both breasts were operated on—a total of 97 operations. In 59 cases partial plastic resection was performed, and in 32 a local excision was made of the affected portion of the breast. In 2 cases all of the gland tissue was subsequently removed by the plastic operation (subcutaneous amputation), and in 4 cases a later total amputation was done.

The subsequent histories of the 83 cases have been investigated. The length of time which elapsed from the first operation varies in these cases from one to seventeen years, an average of over seven years for each case. Four of the 83 patients, or 4.8 per cent., developed carcinoma of the breast—3 after partial plastic resection, and 1 after a simple excision of the tumor. Four patients have died of other causes, without evidence of any disease of the breast. Sixty-two patients are alive and well, and these with the four dead without recurrence, make 66 of the 83 cases, or 80 per cent., free from recurrence and apparently up to the present time, at least, cured of their disease by a partial operation.

Thirteen cases (15.6 per cent.) showed sooner or later a return of the disease. In 5 patients the disease returned in the other breast, and in 8 patients it recurred on the same side, in the gland tissue remaining after the first partial operation. One patient died ten years after operation with a broken hip. Another five years after operation with a cerebellar endothelioma. In neither case was there evidence of any malignant process in the breast, though both were reported to have had recurrence of cysts. Four patients refused operation, and were reported living and well but with cystic disease present—1 one year, and 3 five years after operation. The other 7 were operated on again, by amputation of both breasts in the greater number of cases, and reported well at intervals of ten, five, four, two, one and one-half years, seven months and one month later. Thus either recurrence of the cystic disease or carcinoma occurred in the breast first subjected to a partial operation in 12 cases out of the 83, or 14 per cent. In 16 cases, or 19 per cent., the patient failed to get permanent relief by the partial operation. In this connection it is of interest to note that in 19 of the 83 cases, or 23 per cent., the disease affected both breasts, although in a different degree. Of the 19, 14 had operative treatment on both breasts, and 5 had operation on one side alone.

The authors emphasize that the occurrence of carcinoma in cases of cystic disease, estimated at about 10 per cent. of all cases, demands radical treatment in all but the mildest cases. The operation of choice should remove all of the

gland tissue of the affected side, and, when the disease is bilateral, of both sides, this can best be accomplished by "subcutaneous amputation," leaving the nipple and areola, or by elliptical amputation. Where grave doubt as to diagnosis is present elliptical amputation is to be preferred. Local excision of nodules in the breast, suspected of being malignant, should never be performed. The operation of local excision or partial plastic resection should be restricted to the earliest and mildest types of cystic disease. In such cases plastic resection is the operation to be preferred.

12. Arteriovenous Anastomosis.—A view of Goodman's series of 16 cases shows six successes. Several of the cases which promised success, later required amputation (eight cases), but even these patients received temporary relief from pain. The results seem to warrant the conclusion that the procedure is well worth trying in suitable cases, as it affords the only hope, except amputation, for the patient threatened with gangrene. There were 13 end-to-end anastomoses, 1 side-to-side, and in 2 of the cases, an exposure of the vessels showed that an attempt to anastomose was not warranted, on account of the advanced stage of thrombosis of the vessels. In 2 of the cases with gangrene, a low amputation seemed to be satisfactory. Of the 8 cases which were failures, including 1 death, 1 was side-to-side anastomosis, and 3 of the remainder should not have been operated on on account of the presence of spreading gangrene.

13. Melanoblastomas of Foot.—The disease is one of advanced age. Males preponderate. In a few of the authors' cases there had been a lesion previous to the tumor, in 1 as long as eight years. These tumors spread by way of the lymphatics. The great viscera which are the usual site of blood-vessel metastasis are singularly free in this affection. The disposition to local recurrence is striking. The variability of the physical appearance is in striking contrast to the clinical similarity. In form they vary from small excoriated ulcers not unlike any indolent ulceration to large angry-looking, fungoid, pigmented masses. The variability in form is, however, not essential. They are all tumors which arise in the dermic or subdermic tissue and push through their covering, the difference in form depending on whether or not they just destroy the skin or project above it. The characteristic portion lies beneath the skin, not above it.

These tumors, the authors state, must be reckoned among the most fatal but in some of the early cases cure may be possible. Very early diagnosis is absolutely essential. Unfortunately when they reach the surgeon they have usually already been subjected to local irritation which has but stimulated their growth. Theoretically, at least, local treatment would cure them if done early. Yet there is never any assurance that the tumor is strictly localized. The tumor should therefore be excised in all cases. In early cases local excision should, theoretically suffice, but there is nothing in the literature to justify such a procedure. On the other hand, if dissemination has already taken place, amputation will avail nothing. The patient may as well in that event use his foot during the small span of life still remaining to him. The fungoid type should give a better prognosis than the ulcerous and should give more encouragement to radical operation. When glands along the iliac vessels are involved any operation is useless.

Boston Medical and Surgical Journal
August 13, CLXXI, No. 7, pp. 253-288

- 14 *Effects Observed in the Use of Mixed Toxins (Coley) in Sarcoma. T. W. Harmer, Boston.
15 Roentgen Diagnosis of Incomplete Forms of Pyloric Stenosis. F. H. Baetjer and J. Friedenwald, Baltimore.

14. Mixed Toxins in Sarcoma.—This paper is based on observations made since June, 1909, in the use of mixed toxins of streptococcus and bacillus prodigiosus (Coley) in 91 cases. Some were early cases in the series in which the doses were too small. Some cannot be traced, some were cases in which no pathologic report was obtained. Some were cases of microscopically proved carcinoma. Some were cases of proved sarcoma in which the toxins were adminis-

tered as a prophylactic against recurrence after operations which might of themselves have cured. There remain 32 cases; all of these were primary or recurrent, inoperable sarcomata, or cases in which the disease could not be eradicated at operation. All were proven by microscopic examination. All were under treatment at least three weeks. In all cases the results were free from vitiation by concurrent treatment. The average age of all cases is 33.8 years. The average duration of treatment was three months +. The average maximum dose was 11.9 minims. The maximum dose was 53 minims.

The cases are arranged in six groups, determined by the effect of the toxins. Group A includes those cases in which there was no appreciable effect (10 cases). Group B includes those cases in which the growths softened but did not diminish in size. There were 5 such cases. Group C includes those cases in which the growths disappeared, or practically disappeared, but returned. There were 5 such cases. Group D includes those cases in which growths disappeared but metastases simultaneously occurred. There were 5 such cases. Group E consists of one case in which the growth diminished in size but the tumor still persists. Group F consists of those cases which are apparent cures in which growths have disappeared and no metastases have occurred. There are six such cases. They have remained apparently well since conclusion of the treatment, respectively, one year, two months; two years; two years, seven months; two years, nine months; two years, eleven months, and two years, eleven months.

Harmer emphasizes that the treatment of primary or recurrent inoperable sarcoma with mixed toxins must be intensive. The increment of dose and the interval between injections requires some experience but, even after a considerable experience, this method of treatment is always uncertain and so distressing that, its institution is unjustifiable in any case in which operative measures of reasonable safety offer possible hope of removal. It should be instituted in no case unless proven microscopically to be sarcoma. Its institution is unjustifiable in all cases of inoperable sarcoma. The percentage of apparent cures may be regarded as varying from 9.4 to 18.8. Harmer's study suggests to him that the toxins offer no expectation of benefit in cases with multiple melanotic growths in cases with mixed cell growths, in cases with intra-abdominal growths and in cases arising from subcutaneous tissue or bone, excepting perhaps giant cell growths. It suggests that they may be legitimately tried in cases with single melanotic growths. It suggests that they are apparently of value in cases with sarcomata arising in nose and accessory sinuses, whether spindle cell, giant cell or round cell. The operative treatment of true giant-cell tumors gives, in the majority of cases, such good results that the toxins are not indicated. Their use is, however, warranted in those cases in which the growths are so situated that complete surgical eradication is impossible (such as giant cell tumor of the spine) and in these cases the attack should be primarily surgical, followed by toxin treatment.

Journal of Abnormal Psychology, Boston
June-September, IX, Nos. 2-3, pp. 73-216

- 16 Contrast in Psycho-Analysis: Three Cases. T. A. Williams, Edinburgh.
17 Analysis and Interpretation of Dreams Based on Various Motives and on Theory of Psycho-Analysis. M. Solomon, Chicago.
18 Hysteric Mechanisms in Children. I. H. Coriat, Boston.
19 Psycho-Analysis. P. Janet, Paris.

Journal of Cutaneous Diseases, New York
August, XXXII, No. 8, pp. 545-606

- 20 Syphilitic Heredity and Congenital Syphilis. W. P. Boardman, Boston.
21 Noguchi's Luetin Test for Syphilis. W. A. Pusey and A. W. Stillians, Chicago.
22 Dermatitis Exfoliativa. Report of Case. J. W. Miller, Cincinnati.
23 Case of Bromid Eruption. H. G. Irvine, Minneapolis.

Journal of Infectious Diseases, Chicago
July, XIV, No. 1, pp. 1-243

- 24 An Attempt to Transmit Poliomyelitis by Bite of *Lyperosia Irritans*. E. Francis, Savannah, Ga.
25 *Complement-Fixation in Gonococcus Infections. J. A. Kolmer and G. P. Brown, Philadelphia.

- 26 *Simple Method of Cultivating Bacilli Preferring Conditions of Partial Anaerobiosis. G. D. Horton, Corvallis, Ore.
- 27 An Attenuated Culture of *Trypanosoma Brucei*. C. A. Behrens, Ann Arbor, Mich.
- 28 *Classification of Pathogenic Streptococci by Fermentation Reactions. J. G. Hopkins and A. Lang, New York.
- 29 *Anaerobic Cultures in Scarlet Fever. G. F. Dick and G. R. Henry, Chicago.
- 30 Characteristics of Bacteria of Colon Type Found in Bovine Feces. L. A. Rogers, W. M. Clark and A. C. Evans, Washington, D. C.
- 31 *Toxins of Intestinal Obstruction. F. B. Gurd, Montreal.
- 32 Relationship of Septic Sore Throat to Infected Milk. J. A. Capps and D. J. Davis, Chicago.
- 33 *Experimental Bovine Mastitis Produced with Hemolytic Streptococci of Human Origin. D. J. Davis and J. A. Capps, Chicago.
- 34 Investigation into Fermentative Activities of Aciduric Bacteria. A. H. Rahe, New York.
- 35 *Purpura Associated with *Bacillus Mucosus* in Blood. G. C. Weil and J. W. McMeans, Pittsburgh.
- 36 Sanitation of Swimming Pools. W. A. Manheimer, New York.
- 37 Classification of Colon Group. I. J. Kligler, New York.
- 38 *Quinin Treatment of Rabies. J. G. Cumming, Ann Arbor, Mich.
- 39 Method for Making Carbohydrate Serum Broth of Constant Composition for Use in Study of Streptococci. W. L. Holman, Pittsburgh.
- 40 *Action of Vaccines and Concentrated Antistreptococcus Serum in Experimental Streptococcal Arthritis. J. J. Moore, Chicago.
- 41 Use of Decolorized Acid Fuchsin as an Acid Indicator in Carbohydrate Fermentation Tests. Acid Production by Bacteria. W. L. Holman, Pittsburgh.
- 42 Experiments on Variability of Fermentative Reaction of Bacteria, Especially Streptococci. W. C. Thro, New York.

25. Complement-Fixation in Gonococcus Infections.—About 60 per cent. of all cases of gonococcus infections investigated by Kolmer and Brown reacted positively to the gonococcus complement-fixation test. In the few cases of pyosalpingitis examined, 66 per cent. reacted positively. The highest percentage of positive reactions, 83 per cent., occurred in cases of arthritis, considered clinically as possible gonococcus infections. The authors regard the gonococcus complement-fixation test as of particular value in aiding the diagnosis of the nature of an obscure arthritis, in pelvic inflammatory diseases of women, to deciding whether or not a given case of urethral infection is cured or still harbors foci of living gonococci and aiding in the diagnosis and management of vaginitis in female children.

The reactions are not generally as satisfactory as those occurring in the syphilis reaction because the quantity of gonococcus antibody is much smaller unless grave and widespread gonococcus metastases exist, and the fixation of complement by bacterial amboceptor and antigen is not so marked as that occurring with syphilis reagin and a lipoidal extract. In a comparative study of a number of serums tested with both the antisheep and antihuman hemolytic systems slightly better results were secured with the latter. Gonococcus antigens to be of any value must be polyvalent. An antigen composed of a simple suspension of organisms in saline solution yielded 11 per cent. better reactions than filtrates. It appears that the bacterial protein, aside from the endotoxins, aids in the antigenic effect. Alcoholic extracts of gonococci possess little or no value. The occurrence of positive reactions in about 9 per cent. of cases of chronic gonococcus infections with antigens of staphylococci, streptococci and diphtheroid bacilli, indicates the active rôle these organisms may assume in these infections. The occurrence of about 5 per cent. positive reactions with an antigen of the micrococcus catarrhalis would indicate that this organism may be likewise active in chronic urethritis.

A study of antigonococcus and antimeningococcus sera with antigens of gonococci and meningococci, indicates the close biologic relationship of the gonococcus and meningococcus and while their respective amboceptors are most specific for their own antigens, in lower dilutions this specificity is not so apparent and the results constitute another example of "group" reaction similar to those occurring with the group of streptococci, diphtheria bacilli, spirochetes, etc.

26. Cultivation of Bacilli Partially Anaerobic.—Horton describes his method as follows: Employ an ordinary large test-tube such as is generally used in making potato cultures. In this insert a tightly fitting piece of thin glass which should be about three-fourths the length of the test-tube. Place plain agar-agar as culture medium in the tube and

insert a cotton plug. Sterilize the tube thus prepared. After this process slant the tube so that the agar lies high on one side of the central glass slide. Carefully observe the tube and note this, as exactness in this regard has a direct bearing on the success of the technic. The water of condensation will tend to collect at the bottom of the lower side thus minimizing the chance of surface spreading or contamination of the higher side. Streak the lower side with the *Bacillus subtilis*, taking care to cover the whole surface. Inoculate the higher side with some aborted material, amniotic fluid from an aborted calf, or the fluid from the interior of a cyst of the ovary. After inserting the cotton plug, push it down into the tube and place a tightly fitting rubber cork over it to make the tube air-tight. The tube thus prepared must be incubated at 37 C.

Within two to three days growth will take place on the higher side in which the suspected material was planted, thus enabling a further study of the organisms or colonies present. Horton has had excellent results in using this method for the cultivation of the *Bacillus bifidus*, Tissier, and the *Bacillus abortus*, Bang. To aid in this practice it is suggested that test-tubes with the glass slide be made all in one piece, thus precluding all possibility of the *Bacillus subtilis* contaminating the desired growths. So constructed, the tubes may be slanted in the usual way, there being no need for having one side of the slant higher than the other.

28. Classification of Streptococci by Fermentation.—Analysis of their experiments seems to justify Hopkins and Lang in drawing the following conclusions: The streptococci usually concerned in severe infections in man may be differentiated from the common saprophytic types by fermentation tests. The tests are best performed in infusion broth colored with litmus, containing 2 per cent. or more peptone and 1 per cent. of the fermentable substance. The initial reaction should be between 0.0 and 0.5 per cent. normal acidity (phenolphthalein). Only a complete change of the litmus to pink should be considered positive. The useful test substances are lactose, salicin, raffinose, mannite and inulin.

On the basis of these reactions Hopkins and Lang can recognize the pathogenic and six saprophytic groups: (a) Pyogenic group; characterized by fermentation of lactose and salicin. (b) Four salivary groups; two characterized by fermentation of raffinose, one by fermentation of inulin, and one by failure to ferment salicin, raffinose, mannite or inulin. (c) Fecal group; characterized by fermentation of mannite. (d) Equine group; characterized by failure to ferment lactose. The streptococci in this class are saprophytes and are commonly found in horse dung. Titrations of the amount of acid formed in fermentation are of no value in classification. Tests for ability to hemolyze human blood are of value in that highly pathogenic strains are usually strongly hemolytic. The type of chain formation, the milk coagulation test, and the neutral red reaction, are not reliable as bases for classification.

29. Anaerobic Cultures in Scarlet Fever.—In blood-cultures from 24 cases made anaerobically by Dick and Henry positive results were obtained in 20 cases. A comparison of the kind of organisms found in these blood-cultures with the organisms present in the throat and urine would indicate that during the acute stage of scarlatinal angina, organisms enter the blood-stream in considerable number and are excreted in part at least in a viable condition through the kidneys. The authors suggest that the excretion of living bacteria through the kidney may have some connection with the development of scarlatinal nephritis. A number of organisms are described which are commonly associated with scarlet fever, some of which produce rash in guinea-pigs, but the authors were unable to say that any of these animals really had scarlet fever.

Hemolytic streptococci were found in the blood in 7 cases, in the lymph-nodes in 2 cases, in the spleen in 2 cases and in the urine in 3 cases. Very small streptococci were isolated from the blood in 5 cases. They were much smaller than the hemolytic streptococci and did not as a rule affect

blood. Gram-negative diplococci were recovered from the blood in 1 case, from the urine in 2 cases, and from the throat in 1 case. Large gram-positive diplococci were found in the blood in 3 cases, in the urine in 2 cases and in the throat in 1 case. Diphtheroid bacilli were recovered from the blood in 1 case, from the urine in 1 case and from the throat in 2 cases.

31. Toxins of Intestinal Obstruction.—Gurd's experiments prove that vascular disturbances, namely, venous stasis, are equally as potent as occlusion of the lumen in the development of a poisonous substance in the intestinal mucosa, and that the substance produced in this manner is likewise a splanchnic paralyzer. The development of the poisonous material depended exclusively on vascular disturbance of the gut wall in a number of animals which were operated on and the portal veins or its branches ligated. In all of these operated animals the same type of fluid, which possessed the same toxic properties as the fluids found in closed duodenal loops, was discovered.

Dogs in which the portal vein, or the branches thereof draining the upper half of the intestinal tract, was ligated, died regularly within fifteen to eighteen hours. The animals never completely recovered from the stupor of anesthesia and were frequently found dead in exactly the same position in the cage as when returned from the operating room. The intestines, pancreas, and kidneys were found deeply cyanosed and the heart blood unduly fluid. The lumen of the intestine contained fluid blood-stained material, as a rule of a more watery consistency and deeper purple color than that found in cases of gut occlusion. The intestinal contents were collected from such animals and the cyanosed mucosa scraped off and placed in saline solution under toluol for extraction. Since the mucosa itself appears to contain a greater content of the toxic principle than does the content of the lumen, it would appear that the substance responsible for the intoxicating symptoms is the result of tissue autolysis rather than a bacterial product.

Gurd says it remains to be proven whether the death of the individual in cases of portal obstruction is due to the absence of the liver activity or to the development and absorption of the intestinal toxin, or of a combination of these two factors, and his experiments indicate that the effect on the nutrition of the intestine may be a sufficient cause for the untoward manifestations.

33. Bovine Mastitis and Human Streptococci.—The authors claim that hemolytic streptococci of human origin may cause mastitis, lasting for several weeks in cows. This time roughly corresponds to the duration of milk-borne epidemics. The streptococci may gain entrance through an abraded or injured surface of the teat. It appears possible, therefore, for mastitis in cows to be produced by an infection from the milker whose hands are contaminated perhaps from a sore throat. Mastitis results promptly when the cocci are injected directly into the udder by means of a catheter. The mastitis may exist without physical evidence. A caked bag may not occur, though pus and streptococci in large numbers are being secreted in the milk. Stringy, ropy, or gargety milk may or may not occur during the course of the mastitis.

In order to detect such infections, it might be necessary to examine milk from each quarter for bacteria and for pus. This may explain the failure to detect the source of the streptococci in some of the epidemics of sore throat. No change was noted by Davis and Capps in the cultural or pathogenic properties of the streptococci after growing in the udder of a cow for four weeks. The presence of various contaminating bacteria tend to inhibit the growth of hemolytic streptococci in milk.

35. Purpura with Bacillus Mucosus in Blood.—Clinically, the case studied by Weil and McMeans was a progressively severe bacteremia in which cultures of the *bacillus lactis aerogenes* were obtained during life from the blood, urine and prostatic secretion. Purpura, although a late manifestation, was the result of this infection. On account of the systemic reactions after each surgical interference (passing sounds), of the urethra, the authors feel convinced that this

was the point of entrance of the infection into the bloodstream. The authors suggest that probably infection of the genito-urinary tract by bacteria of the mucosus group is more common than is realized.

38. Quinin Treatment of Rabies.—The quinin treatment was tested by Cumming against fixed virus, as well as, against street virus. The former was a six-day virus, while the latter killed rabbits in about ten days, and guinea-pigs in eight days. The virus was given intracranially; the bisulphate of quinin was used in all experiments, the injections being intraperitoneal. The results were negative. The experiments were controlled both as to the infectivity of the virus and as to the absence, for the most part, of untoward symptoms from the quinin treatment. The dose of virus in most of the tests was not much larger than the smallest infecting dose. This amount of the virus is approximately 1/200,000 part of the total virus in the brain and spinal cord of a rabbit at the beginning of the paralytic stage. Inasmuch as the quinin failed as a preventive measure against extremely small doses of virus in actual tests, Cumming asks whether it cannot reasonably be assumed that this method of treatment is of no curative value in cases of hydrophobia manifesting symptoms in which the amount of virus would be many thousand times greater? In the absence of protection by quinin against small doses of virus, even when a series of daily injections of quinin is given preliminary to the injection of rabic virus, Cumming says, we cannot expect favorable results from quinin after symptoms of hydrophobia have developed.

40. Vaccines in Experimental Streptococcal Arthritis.—Concentrated antistreptococcus serum was prepared by Moore according to the methods employed in preparing concentrated diphtheria antitoxin. Fifty-two strains of streptococci were used including viridans and hemolyticus, as well as strains from cases of epidemic sore throat. The strains were isolated from patients having tonsillitis, alone or complicated with acute or chronic arthritis, endocarditis, serositis, nephritis and pyorrhea. The virulence of many strains was tested on rabbits; thirty-four produced acute or chronic arthritis in these animals. Four series of rabbits were injected with this serum: (a) after the establishment of acute arthritis; (b) immediately after receiving live streptococci; (c) before the injection of the live streptococci; and (d) before and again after receiving the living streptococci. In none of these groups did the concentrated serum appear to have any preventive or curative effect on the acute arthritis. Experimental streptococcal arthritis was either prevented by, or ran a much milder course after, prophylactic injections of a homologous streptococcus vaccine. An immunity was produced which persisted over forty days in at least one case. The immunity appeared to be intimately associated with, and probably dependent on, the production of opsonins. Endocarditis and nephritis were less frequent in the vaccine-treated rabbits than in the controls.

Journal of Outdoor Life, New York

August, XI, No. 8, pp. 225-255

43 Schoolchild Problems in Tuberculosis. F. H. Mann, New York.

44 *Fresh Air and Proper Food in Treatment of Tuberculosis. G. L. Bellis, Oak Forest, Ill.

45 *Problem of Infection in Tuberculous Families. J. B. Hawes, 2d, Boston.

46 Before and After-Care of Tuberculous. E. Hochhauser, New York.

44. Fresh Air and Proper Food in Treatment of Tuberculosis.—All substances Bellis considers proper food for the tuberculous patient that supplies in an easily digestible form and in sufficient quantities all of the elements that go to make up a normal, healthy human being. To promote the eating and digestion of the various materials represented by the classification constitutes the problem of the physician or institution, that would assist nature to the utmost in combating tuberculosis. Primitive man lived in the great out-of-doors and appeased his hunger with such substances as were most easily obtained. Cookery was an unknown art and it may be more than a mere incident that infectious

diseases have multiplied in direct ratio to the extent with which the human race have demanded that the life of food be destroyed by fire before being eaten.

In this age of so-called civilization, people, sick or well, insist that what they eat must appeal to their senses of taste and sight, rather than to a clear complete knowledge of what constitutes nutritious and digestible food. It is somewhat doubtful, says Bellis, if we could return suddenly and completely to the food of primitive man without dire consequences. In the present day we are forced to compromise in the matter of food. The individual patient's taste, digestion, and power of elimination must be considered, together with the economics of the problem. The great majority of persons ill with tuberculosis, and other diseases as well, are finicky in their choice of food. Misdirected sympathy and "mollycoddling" by parents, neighbors, friends, and too often physicians, are responsible for this state of affairs.

The food to be consumed must be rich in those principles most essential to metabolism. Milk stands at the head of the list, for it contains in goodly proportions all of the required elements. Occasionally the taste of milk is repulsive. Where this objection is present, the flavor of the milk can be easily changed by the addition of any one of the numerous spices and extracts. The products of milk, butter and cheese are also exceedingly nutritious. Bellis places eggs second on the list. In their raw state they are especially rich in albumen and fat, easily digested, and ordinarily readily obtained. Beef occupies third place. Raw beef Bellis believes to be a most valuable substitute for raw eggs. Pork in the form of breakfast bacon and ham, the former for its fat content, and both for the intestinal antiseptics which are introduced in their curing, must not be forgotten. Next in importance is a generous mixed diet of vegetables. Not alone because of the very nutritious properties of many of them, especially the cereals and legumens, but also on account of the desirable addition of fats in the form of cream, oils, butter and suet used in their preparation. Coarse vegetables act as a "scrubbing brush" to the entire alimentary canal, cleansing it and stimulating the flow of the digestive juices. The fruits come under this heading and when eaten at appropriate times furnish to the body many elements of great value. Because of their laxative properties, fruits will obviate the necessity for pills in the dietary of many individuals.

45. Family Tuberculosis Infection.—Tuberculosis infection takes place chiefly in childhood years in the intimate contact of family life. There are three classes of tuberculous, says Hawes, which are the chief sources of family infection, the unknown case, the known case treated in his own home, and the returned sanatorium or hospital patient. The last class of returned sanatorium patients is the most important one and best repays our efforts. The responsibility of the State toward its patients, Hawes states, does not end when the patient is discharged nor does the responsibility of the municipality end when the patient leaves for a State sanatorium. Cooperation between State and local forces must be constantly striven for. Tuberculosis is primarily a local problem but the State may well direct and advise but not replace local work.

Hawes' paper is based on a study of 600 patients, discharged from various State sanatoriums. The great majority of them, approximately 83 per cent. were in the advanced or moderately advanced stages of the disease at entrance to the sanatoriums, while nearly 50 per cent. were discharged with positive sputum and with the disease still active. These 600 patients, including in these figures only the immediate members of the family, exposed 2,601 others to this disease. Of these 2,601 individuals, only 597 or 23 per cent. had ever been examined for tuberculosis, despite the fact that at the patient's admission to the sanatorium his physician as well as the local board of health were at once notified so that the other members of the family might be examined. Of these 597 exposed patients, who were examined, 75 or 12½ per cent. were found to be positive cases of tuberculosis.

There were 966 children, 15 years and under among those exposed individuals. Of these 362 or 38 per cent. had been examined and 38 or 10½ per cent. found to be positive cases.

The aims in Massachusetts are to have a trained social worker in each institution. It will be the duty of such a person to become acquainted with the patients, devoting her attention especially to those about to leave, finding out their plans for the future and preparing the way for them. In addition to this there should be one or more field workers for each institution. The work on behalf of the State will be to direct and encourage such local work.

Journal-Lancet

July 15, XXXIV, No. 14, pp. 371-398

- 47 Work of the Medical Profession. F. A. Spafford, Flandreau, S. D.
- 48 Relation of Sanitation to Death and Disease. H. W. Hill, St. Paul.
August 1, XXXIX, No. 15, pp. 339-424
- 49 Nursing as Profession. G. D. Head, Minneapolis.

Lancet-Clinic, Cincinnati

August 1, CXII, No. 5, pp. 117-140

- 50 Conservation of Hearing Function. W. C. Phillips, New York.
- 51 Causative Factors in Mental and Nervous Diseases. J. C. George, Dayton.
- 52 Surgical Disorders of Digestion. W. D. Haines, Cincinnati.
August 8, CXII, No. 6, pp. 141-168
- 53 Surgery in Relation to Life Insurance. W. J. Mayo, Rochester, N. Y.
- 54 Abuse of the Obstetrical Forceps. J. W. Rowe, Cincinnati.
- 55 Torticollis. H. H. Hoppe, Cincinnati.

Medical Record, New York

August 15, LXXXVI, No. 7, pp. 279-320

- 56 Present Estimate of the Value of Radium in Surgery. R. Abbe, New York.
- 57 Trichinosis, with Report of Fifteen Cases. M. H. Sicard, New York.
- 58 Case of Phlebitis of the Penis, Simulating Edema Induratum, Complicating Acute Gonorrhea. M. Zigler, New York.
- 59 Tonsillectomy, Its Indications and Choice of Operation. W. H. Huntington, Washington, D. C.
- 60 Bacillus Coli Infections in Infancy and Early Life. W. M. Hartshorn, New York.
- 61 Ulcus Cruris Inveteratum. W. P. Cunningham, New York.
- 62 The End of Life. C. R. Green, Troy, N. Y.

Military Surgeon, Chicago

August, XXXV, No. 2, pp. 101-210

- 63 Sanitary Service of Maneuver Camps. J. H. Ford, U. S. Army.
- 64 Proposed Methods of Pitching and Striking Pyramidal, Small Pyramidal and Ward Tents. W. W. Reno, U. S. Army.
- 65 Investigation Relative to Life Cycle, Breeding, and Some Practical Means of Reducing the Multiplication of Flies in Camp. H. C. Michie, U. S. Army.
- 66 Relation of Army Surgeon to Civilian Surgeon. H. C. Coe, U. S. Army.

Oklahoma State Medical Association Journal, Muskogee

August, VII, No. 3, pp. 79-109

- 67 Relationship of Nervous Diseases to Venereal Diseases. J. W. Duke, Guthrie.
- 68 State Health Problems. J. C. Mahr, Oklahoma City.
- 69 Puerperal Infection. C. R. Hume, Anadarko.
- 70 Treatment of Puerperal Sepsis. W. A. Fowler, Oklahoma City.
- 71 Intestinal Obstruction. M. H. Foster, Alderson.

Southern Medical Journal, Mobile, Ala.

August, VII, No. 8, pp. 603-680

- 72 Early Diagnosis in Malarial Infections. G. E. Henson, Jacksonville, Fla.
- 73 Pituitary Disturbance as Related to Some Cases of Epilepsy, Psychoses, Personality and Other Obscure Problems. B. R. Tucker, Richmond, Va.
- 74 Use of Pituitary Extract in Obstetrics. F. W. Wilkerson, Montgomery, Ala.
- 75 Diagnosis of Certain "Stomach Cases." A. G. Brown, Jr., Richmond, Va.
- 76 Hyperchlorhydria. C. Stanley, Washington, D. C.
- 77 Effects of Alcohol on Mental and Nervous Diseases. H. S. Ward, Birmingham, Ala.
- 78 Some Physical Reasons Why We Are What We Are. G. H. Benton, Miami, Fla.
- 79 Fissure in Ano or Painful Ulcer. C. D. Render, Birmingham, Ala.
- 80 Relation of the Medical Profession to Accident Insurance. W. E. Magruder, Baltimore.
- 81 *Ovariectomy Sub-Partu. W. Kohlmann, New Orleans.
- 82 Congenital Pyloric Stenosis with Report of Cases. L. S. Booker, Durham, N. C.

- 83 Use of Iodin in the Abdomen; Report of Eight Cases. J. G. Gaither, Hopkinsville, Ky.
- 84 *Elimination of the Preventable Seven Per Cent. Mortality in the Surgical Treatment of Acute Abdominal Diseases. F. G. Du Bose, Selma, Ala.
- 85 Appendiceal Abscess—A Clinical Study. J. L. Campbell, Atlanta, Ga.
- 86 Iodin Technic in Surgery. W. H. Wilder, Birmingham, Ala.
- 87 Case of Sub-Temporal Decompression for Relief of Intra-Cranial Pressure of Obscure Origin: Recovery. G. T. Tyler, Jr., Greenville, S. C.
- 88 Complications of Submucous Resection of the Nose. W. L. Simpson, Memphis, Tenn.
- 89 Epithelioma Following a Pterygium. R. Fagin, Memphis, Tenn.
81. Abstracted in THE JOURNAL, Dec. 20, p. 2270.

84. Surgical Treatment of Acute Abdominal Diseases.—Du Bose summarizes his paper as follows: 1. There is a preventable death-rate of approximately 7 per cent. in acute abdominal diseases. 2. To overcome this a diagnosis of at least the presence of an acute abdominal condition must be made at the first visit or less than twelve hours after its onset. 3. To appreciate that early operation is the safest of all treatment. That the measures advised by the advocates of masterly inactivity are never safe, are a last resort, to be used only on those unreasoning people who refuse surgery, or on those who are seen late in the disease, and on these only until they can be brought to a hospital and have had operative relief. 4. To stop teaching and reporting statistics of cases treated by the expectant plans without paralleling such records with those in which immediate diagnosis and prompt surgical operations are done and a comparison of results in each series. 5. To encourage a more intimate relation with the internist and have him witness operations and there study the living pathology. 6. To let surgeons and internists appreciate the fact that the symptoms are not always in direct ratio to the severity of the unseen pathologic process.

West Virginia Medical Journal, Wheeling

August, IX, No. 2, pp. 41-74

- 90 Typhoid Fever and Illegal Practitioners vs. State of West Virginia. W. W. Golden, Parkersburg.
- 91 Acute Diarrhea of Children. W. Gaston, Parkersburg.
- 92 Inflammations of Nasal Accessory Sinuses. H. H. Haynes, Clarksburg.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

July, XI, No. 127, pp. 289-336

- 1 *Intramuscular Injections of Antitoxin in Treatment of Diphtheria. J. D. Rolleston and C. MacLeod.
- 2 Salvarsan and Neosalvarsan in Treatment of Hereditary Syphilis. J. L. Bunch.
- 3 Case of Mesenteric Thrombosis in Youth Originating from Caseating Tuberculous Gland. H. L. Murray.

1. Intramuscular Injections of Antitoxin.—Intramuscular have entirely supplanted subcutaneous injections of diphtheria antitoxin at the Grove Hospital. Without preliminary washing the outer side of the thigh in its middle third is painted with 2 per cent. solution of iodine, the needle is driven deep into the body of the vastus externus, and the injection is given in the ordinary way. Twenty thousand units (= 50 c.c.) can readily be injected even in small children, but the authors have never exceeded this dose at one time. Their youngest patient, aged 2 weeks, received 4,000 units for nasal diphtheria without any ill-effects. Directly the needle has been withdrawn after injection, the site of puncture is again painted with the iodine solution and a collodion scab is applied.

The thigh is preferred to the gluteal region not only because there is less probability of injuring important vessels or nerves but also because the thigh muscles are much more compact and exercise greater pressure on the injected fluid, rendering absorption more rapid. Not only is the actual injection much less painful, but the subsequent pain which often causes a restless night and persists for two or three days after subcutaneous injection, is ill-marked and often entirely absent. It is superior to the intravenous method.

not only in the greater simplicity of its technic, but also in the less rapid excretion of antitoxin after injection. The more rapid absorption of antitoxin by the intramuscular route is shown, not by the effect on the faucial or laryngeal process, but by the lesser incidence of paralysis, especially of a severe kind.

British Medical Journal, London

August 1, II, No. 2796, pp. 221-276

- 4 On the Making of a Scottish Medical School. A. Ogston.
- 5 *Medicine from the Chemical Standpoint. A. E. Garrod.
- 6 *Surgeon of the Future. J. Bland-Sutton.

5. Medicine from the Chemical Standpoint.—After touching on the foundations of medicine, the progress of chemical science and biochemistry, Garrod discusses generally, the investigations made into the proteins and other compounds, the specificity of chemical structure, the metabolic activities of the living organism, the regulation of metabolism, inborn errors of metabolism, protective mechanisms against toxic agents, metabolic disturbances due to disease of organs, deficiency diseases, influence of chemical knowledge on the practice of medicine, chemistry in diagnosis, dietetics, therapeutics, empiric and scientific. Concluding, he says, that the reason the progress of medicine has been more rapid in recent years than ever before is due to the cumulative advance of science as a whole. Modern physics and chemistry, and the borderland science of physical chemistry, have rendered possible modern physiology and pathology, and on the foundation thus provided is being raised the stately edifice of a modern medicine, in which the scientific spirit shall have freer play than heretofore.

6. Surgeon of the Future.—Speaking of the surgeon of the future, Bland-Sutton says that surgeons are of two types: they are either craftsmen or biologists. The surgical craftsman invents variations in technic—metal plates, wires and screws for bones; or fancy methods of suturing wounds. Some expend their ingenuity on surgical cutlery and improve the knives and needles. The utility of a simple tool such as the clip forceps is inestimable. In spite of much ingenuity among surgeons an ideal ligature material awaits discovery. Clever contrivances like the laryngoscope, bronchoscope and cystoscope have revolutionized special branches of surgery. Another useful instrument, the esophagoscope, requires for its successful use a surgeon with the instincts of the sword swallower and the eye of a hawk.

The biologic surgeon studies pathology in its broadest aspect and investigates, in the laboratory, problems of morbid anatomy and bacteriology. The diagnostic value of reports issued from the laboratory by the pathologist and the bacteriologist, to be of value, must be estimated with the help of clinical experience. If the surgeon has had no experience in bacteriologic methods he must accept the reports from the laboratory with the hopefulness of a patient swallowing physic compounded from a prescription he does not understand and which he is often unable to read. The training of surgeons in clinical pathology is of great importance, and it requires little foresight to recognize that for men ambitious to attain high places in surgery the high road lies through the pathological institute.

Dublin Journal of Medical Science

July, III, No. 511, pp. 1-80

- 7 Experiences with Wassermann Reaction. E. J. McWeeny.
- 8 *Clinical Report of the Rotunda Hospital for One Year, November 1, 1912 to October 31, 1913. H. Jellett, D. G. Madill, R. M. Allen.
- 9 Etiologic Controversy anent Beriberi with Some Remarks as to Milled Rice. H. D. King.

8. Clinical Report of Rotunda Hospital.—The Hospital Staff of the Rotunda Hospital attended 4,136 labors from November, 1912, to November, 1913, with a mortality of 0.41. Seven deaths occurred in the extern department, eleven deaths in the intern department. Four deaths were the result of septic infection, one the result of accidental hemorrhage, one the result of unavoidable hemorrhage, and one the result of pulmonary embolus. There were twelve cases of unavoid-

able hemorrhage. Three mothers died—one of pyemia with thrombosis of the right ovarian vein. In the second case—one of central placenta praevia—bipolar version was performed, but the patient collapsed immediately after. The postmortem examination showed fatty degeneration of the heart. There was no hemorrhage after the version was completed. The third death also occurred in a case of central placenta praevia at term. There had been intermittent hemorrhage for four weeks before admission. Bipolar version was performed, and the patient delivered herself spontaneously four hours later. The postmortem examination showed that there was a tear of the cervix involving the bladder.

There were 24 cases of contracted pelvis. In four cases delivery was spontaneous. In 5 cases the forceps were applied, and delivery effected. In 2 cases, internal podalic version was performed. In 1 case, the child was extracted as a breech presentation. In 7 cases, cesarean section was performed, and in three cases pubiotomy was performed. Two patients died after cesarean section, both from septic poisoning. In one case of pubiotomy, the piece of bone between the saw-cut and the symphysis came away during the puerperium. This occurrence made not the smallest difference to the patient's power of walking. If anything, she walked better, and at an earlier date, than do the average number of pubiotomy patients. This patient subsequently delivered herself spontaneously in the hospital. There were 13 cases of prolapse and presentation of the cord. Five children were born alive, and 8 were born dead. There were only 5 cases of eclampsia. All the mothers recovered, and 4 children out of 6 were born alive. The forceps was applied in 64 cases. All the mothers recovered, and 54 children were born alive.

Lancet, London

August 1, 11, No. 4744, pp. 281-358

- 10 *On Gastric Ulcer with Special Reference to Its Treatment by Gastrostomy. W. W. Cheyne.
- 11 Selection of Method of Operation in Treatment of Gastric and Duodenal Ulcers. A. von Eiselsberg.
- 12 *Internal Derangements of the Knee. R. Jones.
- 13 Results of Operation (Laryngo-Fissure) for Intrinsic Cancer of Larynx. E. Schmiegclow.
- 14 Hyperthyroidism: Primary and Late Results of Operation. C. H. Mayo.
- 15 Typhoid Perforation. G. E. Armstrong.
- 16 Treatment of Inoperable Carcinoma of the Uterus by Application of Heat. J. F. Percy.
- 17 Factors of Safety in Cleft-Palate Surgery. J. R. Eastman.
- 18 *Suture of the Levator Ani Muscle in Perineorrhaphy Operations. H. Jellett.
- 19 *Results of Radical Operative Treatment of Cancer of the Uterus. T. Wilson.

10. Gastric Ulcer Treated by Gastrostomy. — Cheyne believes that the question of gastrostomy is worth while considering in cases of adherent ulcers nearer the pyloric end which cannot be excised, in preference to gastro-enterostomy and closure of the pylorus. The advantages are very great. In the case of stricture of the urethra the quickest way of getting rid of the induration of the walls is to tie in a catheter for a few days and it seems to Cheyne, that the same result would probably follow in an indurated ulcer of the stomach. He would, of course, combine infolding of the ulcer with the gastrostomy whenever possible. While gastrostomy has not previously been suggested as a method of treating gastric ulcer, jejunostomy has been carried out in a considerable number of cases of ulcer of the duodenum on much the same principles, but although it has its warm advocates the idea does not seem to have taken hold. It seems to Cheyne that jejunostomy for duodenal ulcer does not possess the advantages that gastrostomy offers in the case of certain gastric ulcers. Ulcer in the duodenum seems to set up, and keep up, hyperchlorhydria and movements of the stomach and this may continue even though the patient is fed through a jejunostomy opening. Cheyne suggests that even in cases of duodenal ulcer, a gastrostomy with passage of the tube well down the duodenum, combined with infolding of the ulcer, might act better than jejunostomy, and might

possibly take the place of gastro-enterostomy and occlusion of the pylorus in cases in which the infolding of the ulcer did not produce serious constriction of the lumen of the duodenum.

In a case cited there was an ulcer of considerable size on the posterior surface of the stomach, high up near the cardiac end and firmly adherent to the parts behind, and on the anterior wall of the stomach at the same point there was also a commencing contact ulcer. The conditions were most unfavorable for excision. What Cheyne did, therefore, was to leave the ulcer alone and to perform gastrostomy beyond the ulcer by Witzel's method, pushing the catheter through the pylorus and for about 3 inches along the duodenum. The patient was fed through the tube very soon after the operation, and the tube was left *in situ* for six weeks, when it was removed and the wound allowed to heal up. No food was given by the mouth for five weeks. The immediate result of the operation was that the patient at once lost all pain and discomfort from which she had previously suffered, and rapidly began to put on flesh and regain strength, and there was no trouble about the wound which healed in a few days, except, where the tube passed down to the stomach. When tested with food by the mouth at the end of five weeks no discomfort was caused, and on leaving out the tube a week later the wound closed in a few days and since then she has had no further trouble.

12. Internal Derangements of the Knee.—Speaking of luxation of the internal semilunar cartilage, Jones says that he refuses to operate in any case which he sees immediately after the first displacement, as so large a proportion of such cases get well under appropriate treatment, nor does he encourage operation in cases in which the recurrent trouble is painless and is never followed by effusion into the joint. He strongly advocates operation in cases in which the recurrence is sometimes followed by acute symptoms and encourages it in all recurrent cases in which a strenuous athletic life is a means of livelihood or a physical necessity. Operation is a positive necessity in the case of men who work among moving machinery or stand in positions in which a yielding knee may mean disaster. He has operated on patients from 12 to 60 years; age, therefore, is not a contraindication. An argument in favor of operation is the occurrence of tubercle and so-called rheumatoid trouble as a direct result of the irritation of a displaced cartilage. Further, a knee which has been the seat of trauma is very susceptible to infection, and he is, therefore, careful not to operate during the presence of effusion nor to move it during operation for fear of the ingress of air or dust.

18. Suture of the Levator Ani Muscle.—The essential features of the operation devised by Jellett are: (1) The careful dissection of the necessary amount of vaginal mucous membrane off the rectum; (2) the exposure and suture of the separated levator ani muscles; and (3) the careful approximation of the cut edges of the vaginal mucous membrane in such a manner as to leave no projection or redundancy. The operation is carried out as follows: The extent of the perineal tear is carefully determined, and its anterior edges are marked out by bullet forceps. A third bullet forceps is applied to the perineal skin just behind the posterior edge of the tear. The position of the separated edges of the levator ani is determined by palpation through the mucous membrane of the vagina. An incision is then made from side to side along the line of junction of the skin and the vaginal mucous membrane. This incision cuts through the skin and any underlying scar tissue. A flap of vaginal wall is then dissected up off the underlying rectum. At its lowest part it is firmly held to the rectum and the sphincter ani by cicatricial bands, the result of the old cicatricial healing. As soon, however, as these have been cut through the separation of the remainder of the flap by blunt dissection is an easy matter.

When the dissection of the flap is complete a triangular space is exposed, which is bounded laterally below by the remains of the superficial vaginal and perineal muscles, and at a deeper level by the pubo-coccygeal fibers of the levator

ani muscle, while its floor is formed by the rectum. It is then an easy matter to catch the edges of the levator with clip forceps or dissecting forceps, and to draw them downward and inward until they meet in the middle line. If the separation and atrophy of the muscle are marked, then it may not be possible to draw the edges down sufficiently, but in the great majority of cases they can be brought into view. Three or four interrupted sutures of catgut are then passed through them from side to side, so that when tied they will approximate them in the middle line; for the present, however, they are left untied.

The next step is to trim the vaginal flap into proper shape, so that when the operation is complete there may be no redundancy. The cut edges of the flap are then brought together by a continuous catgut suture passed from above downward, and ending at the vulvar orifice. This being done, the catgut sutures in the levator muscle may be tied. The last step consists in the introduction of silkworm gut sutures passed so as to close the skin edges of the perineal wound. These sutures are passed from side to side, and traverse the skin and the remains of the superficial perineal muscles and also the elevator muscle, so as to supplement the buried catgut sutures. Any bleeding vessel, if of large size, should be caught and tied, but, as a rule, the best method of stopping bleeding is by proceeding rapidly with the operation.

19. Treatment of Cancer of the Uterus.—From 1896 until Dec. 31, 1913, Wilson operated on 596 cases of uterine cancer. Of these, in 67 the disease affected the uterine body. Among the 67, 15 vaginal hysterectomies with no mortality, and 29 abdominal hysterectomies with 3 deaths, were performed. Until the end of 1913 there were 529 cases of cancer of the cervix uteri. These can be conveniently divided into two groups according as operation by the vaginal or the abdominal route was the method of choice. In the first period, lasting until the end of 1905, there were 246 cases of which 37 were operated on by the vaginal method with one death, and 7 by the abdominal route with 6 deaths. In the second period, from Jan. 1, 1906, to Dec. 31, 1913, 283 cases were seen, among whom 20 were operated on by the vaginal route with no deaths and 72 by the abdominal with 8 deaths. The total immediate mortality of the vaginal method has been 57 cases with one death, or less than 2 per cent.; and of the abdominal, 79 operations with 14 deaths or 17.7 per cent. The great majority of abdominal hysterectomies were performed by Wertheim's method. The ratio of operability has steadily increased; in the years 1896 to 1899 it was 14 per cent.; in the last four years it has been more than 36 per cent.

The total five year results up to June 30, 1909, have been investigated and show that, with an increased operable ratio and the adoption of the abdominal method of operation the absolute curability of Wilson's cases have risen from 5.5 to 10.2 per cent. Of the patients surviving operation 16 of 51=31 per cent. of the vaginal, and 10 of 23=43 per cent. of the abdominal, remained well and free from recurrence for five years and upward.

Annales de la Société Méd.-Chir. de Liège

LIII, Nos. 1-6, pp. 1-126

- 20 *Intermittent Crippling Contracture of Various Muscles Except Those of Face and Chest in Otherwise Healthy Young Man. (Myotonic acquire.) L. Beco.
- 21 Present Status of Operative Treatment of Glaucoma. L. Weekers.
- 22 *Is Operative Treatment Required for Small Bullet Wounds of Chest or Abdomen? Lenger, L. Delrez and C. Tecqmenne.
- 23 Perforated Duodenal Ulcer; Five Cases. C. Tecqmenne.
- 24 Importance of Radiography in Diagnosis of Renal Tuberculosis. Rogge.
- 25 Stenosis of the Pylorus with Hematemesis in Three-Weeks' Babe; Recovery after Posterior Gastro-Enterostomy. A. Hougardy.
- 26 *Divergent Dislocation of the Metatarsus. Lenger.
- 27 *Megacolon. (Maladie de Hirschsprung.) M. Dubois.
- 28 Roentgenoscopy of the Stomach and Intestines. (Examen du tube digestif aux rayons X.) Bienfait.

20. Acquired Myotonia.—The young man's general health in the case reported by Beco has not been impaired by the intermittent severe contracture of the various groups of

muscles whenever he attempts to use them. He is robust and apparently free from inherited or acquired taint and had always been healthy until two abscesses developed on the right foot a year ago. The contractures occur even during sleep, but the sensibility and responses to electric tests are approximately normal. This justifies a more favorable prognosis than with ordinary myotonia, Beco adds.

22. Gunshot Wounds of the Abdomen.—Delrez and Lenger do not agree in their views on this subject. The latter advocates abstention as long as there are no signs of internal hemorrhage or other disturbance, while Delrez pleads for a prompt laparotomy with every bullet wound of the abdomen so as to ascertain and remedy any injury of the viscera. Each presents an array of cases which apparently sustain in turn each of the divergent views.

26. Dislocation of the Metatarsus.—Lenger remarks that divergent dislocation may almost be said to be merely the exaggeration of a physiologic movement. Reduction under a general anesthetic should be done at once if the dislocation is seen before the foot is swollen. When edema has developed, roentgenoscopy from the front and side may be necessary to ascertain the true condition. The main point in treatment is to restore the first metatarsal bone to place. When this is accomplished one can be content without attempting more. It might be imprudent to cut into the foot to restore the four other metatarsal bones to place. But if the first metatarsal bone cannot be reduced without operating, do not hesitate to expose it; it is possible that reduction of an intervening tendon may be all that is necessary. When the foot is crushed and amputation becomes necessary, if the first metatarsal bone can be saved, the functional use of the foot is retained and the gait not affected. This is because the foot is really made up of two parts, both triangular, a rear and internal tarso-metatarsal part, constituted by the seven bones of the tarsus and the first metatarsal bone. This is the strong arch of the foot, the arch of strength and movement; the arch rests on two supports: on the heel at the back and on the head of the first metatarsal bone in front. These two abutments support the weight of the body in walking and standing. The other part of the foot comprises the last four metatarsal bones, and it serves only to maintain the balance of the foot. Two tendons passing across the hollow of the foot define and separate the two parts. Lenger insists that the surgeon should feel that his task is done when he has succeeded in reproducing the arch of strength and movements. The rest of the foot can be left unmolested. Reexamination of one patient ten years after amputation of the last four metatarsal bones, run over by a wagon, shows perfect control of the foot. It is held and used normally, thanks to the preservation of the entire tarsus and the first metatarsal bone.

27. Megacolon.—Dubois' patient is a boy of nearly 12 with pronounced Hirschsprung's disease; extreme constipation had been the rule since early infancy, the stools were fluid, the peristalsis of the colon abnormally intense; the abdomen measured 71 cm. Of late there had been intermittent, more or less complete obstruction of the intestinal tract. Although the stools were fluid they were not abnormally frequent except when diarrhea alternated with inveterate constipation. Colitis is the rule, and there may be ulceration. The food should be such as to leave little waste, and the bowel should be rinsed out through a long soft tube with tepid water containing a teaspoonful of sodium bicarbonate and one of salt to the liter. This softens up impacted feces and promotes its expulsion; in his case the girth went down from 71 to 55 cm. in five days under this treatment. Dubois does not approve of operating on children under 5 except in emergencies. In the cases on record operative treatment on 14 infants was followed by 100 per cent. mortality; in 28 between 2 and 5, the mortality was 40 per cent.; in 46 between 5 and 15, it was 26 per cent.; in 41 between 15 and 50, it was 27 per cent. and in 14 patients over 50, it was 85 per cent. Colostomy should be merely the first step of the more complex operation. Taking up a fold in the colon,

fixation or colostomy are incomplete and do not do much good, and resection at one sitting is dangerous. Unilateral exclusion and implanting the ileum in the sigmoid loop is much better in most cases.*

Bulletin de l'Académie de Médecine, Paris

LXXVIII, Nos. 26-28, pp. 879-994 and 1-61. Concluded from p. 611

- 29 Gratifying Results of Special Training for Certain Mentally Defective Children. (Adaptation sociale des enfants psychonormaux éducatibles.) J. Roubinovitch.
- 30 *Improvement of Myxedematous Boy of 14 after Graft of Monkey's Thyroid. (Greffe de la glande thyroïde d'un singe à un enfant atteint de myxédème.) Voronoff.
- 31 *Ascaris in Pyopneumothorax; Eighth Case on Record. R. Blanchard and M. Letoux.
- 32 Morphine Acted on by Yeast as Analgesic. (Analgésie obstétricale.) Ribemont-Dessaignes, Bazy and Bourquelot.
- 33 Liver Lesions with Amebias Seven and Eighteen Years after Latent Infection; Two Cases. (Amibiase hépatique tardive de forme nodulaire.) C. Achard and C. Foix.

30. Graft of Monkey's Thyroid Improves Myxedema.—Voronoff's patient was a boy of 14 who had developed myxedema after measles at the age of 8. The graft of the right lobe of the thyroid with its parathyroids was taken from a large monkey—a baboon—and implanted in the neck of the boy. It was embedded in a vascular region and was sutured closely to the surrounding tissues in order to promote adhesions and formation of new vessels. Voronoff states that during the six months since, the gradual improvement in both the physical and the mental condition has been striking. The boy had formerly been apathetic and stupid, the skin scaling off, the nose and lips enlarged; all this has retrogressed and the features show nothing abnormal while from his former apathy in school the boy has become lively and unruly.

31. Ascaris in Pyopneumothorax.—A robust country woman was taken suddenly with pains suggesting pleurisy and puncture later revealed fetid pus. After a purge she passed two ascarides. As the pyopneumothorax persisted in spite of treatment, the pleura was opened and a macerated ascaris was found in the pus. Recovery was soon complete showing that there could not have been a fistula at any point.

Journal de Médecine de Bordeaux

July 19, LXXXI, No. 29, pp. 485-498

- 34 Neosalvarsan in Syphilitic Keratitis. C. Fromaget.
- 35 *Tardy Equivalents in Gastric Pathology. R. C. Augistrou.

35. Tardy Equivalents in Gastric Pathology.—Augistrou gives the details of 7 cases in which there were various disturbances coming on two or three hours after a meal, but not the usual train of pains relieved by vomiting, with the painful point in the back when food is ingested. Instead of this familiar syndrome, his patients had various disturbances which he regards as the recurring equivalents of the above syndrome. Five of them at this time after meals became dizzy and extremely depressed with tremor and profuse sweating, some feeling that death was impending. Two had besides recurring pain in the shoulder and arm or lower part of the chest. In only 2 of the 7 cases were the patients relieved by taking food, and one by vomiting. In only 2 cases was the stomach region tender during the acute phase. In 2 cases, however, there was a history of the typical tardy gastric pain in former years. In another case the atypical disturbances described above progressed to become finally the true typical attacks. One case was peculiarly instructive as the typical and atypical disturbances alternated, all coming on at the same hour after eating, the reflex pains and the general reaction at one time and another day the intense pain localized in the stomach.

Some of the patients had been treated for months in vain with drugs to act on the nerves and neuralgia, but a cure was soon complete when the diet was restricted to milk and egg dishes, with some alkaline powder. The gastric juice may be secreted in excess or there may be a deficit; the only reliable differential signs are the regularity of the interval after eating when the disturbances appear and their subsiding again; the regular recurrence for a few days to two

weeks or more, and the usually complete cure under the simplest dietetic measures. The trouble is not hyperchlorhydria but merely abnormal sensitiveness of the gastric mucosa or spasm of the pylorus in persons with an unstable nervous system. All the above patients were what he calls inveterate neuropaths, great talkers, easily moved to tears or anger, and often complaining of headache and not feeling well in the morning.

Journal d'Urologie, Paris

July 15, VI, No. 1, pp. 1-152

- 36 *Anuria from Relics of Old Pelvic Inflammation. (Des anuries de cause indéterminée.) P. Bazy.
- 37 *Reflux of Urine into Ureter; Four Cases. (Reflux urétéral acquis.) O. Pasteau.
- 38 *Suburethral Abscess in Women. (Abscess urinaire chez la femme.) P. Héresco and M. Cealic.
- 39 *Syphilitic Lesions in the Bladder. (Syphilis vésicale.) G. Gayet and Favre.
- 40 *Restoration of the Bladder. R. Grégoire.
- 41 *Modified Technic for Perineal Prostatectomy for Cancer. R. Proust.

36. Anuria from Indeterminate Cause.—Bazy reports several cases of anuria apparently ascribable to a calculus but nothing of the kind could be found, and the course of the cases showed that the trouble was some mechanical obstruction of the ureter, but not from stones, neoplasms or inflammatory processes. In the first case a man of 73 had had kidney colic and passed gravel at various times. The ureter evidently became dilated and stretched during the course of this nephrolithiasis, with the consequence that it became kinked low down and anuria resulted. Roentgenoscopy showed some vague shadows which suggested calculi in the pelvic ureter but which must have been of other origin. These misleading shadows were noticed also in two other cases of anuria in all of which concretions were incriminated but finally they had to be exculpated. Decapsulation of the kidney in one case started instantaneously the natural flow of urine. These "false calculi" are generally multiple and bilateral; the organs and soft parts in which they are located are movable, and hence the false calculi can be displaced in their relative positions. They are evidently relics of old inflammation in the pelvis and may drag on or kink the ureter in time.

37. Reflux of Urine into Ureter.—Pasteau does not refer to a congenital dilation of the ureter but to an acquired permanent gaping of the pathologic ureter mouth, or to a transient gaping. He describes a case of the latter in which an opaque fluid in the bladder was forced up into an apparently normal ureter between the spurts of urine from the ureter. The other ureter and kidney were tuberculous. After nephrectomy there was no further reflux in the other ureter, demonstrating that there had been no anatomic lesion but merely transient atony of the musculature. The danger is imminent of infection of the sound kidney from the reflux thus invited; it is further favored by the abnormally powerful contractions of the secondarily inflamed bladder. Another point to be borne in mind is the possibility of blundering in the diagnosis when from the ureter urine is drawn that came from the bladder instead of the kidney.

38. Suburethral Abscess in Women.—Héresco and Cealic report four cases of abscess on the median line just below the urethra in which the pus was mixed with urine, all the features of the suppuration corresponding to the analogous urinary fistulas in men.

39. Syphilis of the Bladder.—Gayet and Favre give a colored plate of the findings in three cases. The hematuric cystitis subsided so promptly under treatment for syphilis that there can be no question, they declare, of the specific nature of the bladder trouble. The hematuria came on suddenly and was profuse in each case, recurring, uninfluenced by local measures, at nearly every micturition, with more or less pain. The cystoscopic findings illustrated show various phases of syphilitic affections of the bladder. When they have progressed to ulceration, secondary infection blurs the clinical picture. The trouble usually is differentiated only by exclusion after the failure of ordinary measures.

40. **Restoration of Bladder.**—Grégoire thinks that the case he reports is the first to be published in which a new bladder was made from the rectum for extensive destruction of the vesicovaginal wall without exstrophy or cancer of the bladder. This is the fifth case in which this technic has been applied. Continence of urine was not secured in any instance but the results of the operation otherwise were satisfactory.

41. **Modified Perineal Prostatectomy.**—Proust's technic is profusely illustrated, featuring his method of locating the ureter where it crosses the vas deferens. Following the latter up to the seminal vesicles on each side, separating these from the bladder and turning them over backwards, exposes the region below so that access to the ureters is rendered simple by following along the vas on each side.

Lyon Médical

July 19, XLVI, No. 29, pp. 97-140

- 42 Nephropexy for Movable Kidney. G. Gayet.

Presse Médicale, Paris

July 25, XXII, No. 59, pp. 565-576

- 43 *Comparison of Phthalein-Test Findings with Excretion of Urea in Chronic Nephritis. (L'épreuve de la Phénolsulfonphthaleïne.) F. Vidal, A. Weill and P. V. Radot.
44 Convuluted Thickening of the Scalp. (Pachydermie vorticellée du cuir chevelu.) Malartic and Opin.

43. **Phthalein Test and Urea Excretion.**—Vidal, Weill and Radot state that with the phthalein test, the Ambard formula and tests for urea in the blood-serum, remarkably parallel findings were obtained with all. They list them from a number of cases, the figures all rising and falling together, both in normal persons and in patients with Bright's disease as also in patients with both heart and kidney disease but not oliguria. This parallelism confirms the precision of the various tests and favors the choice of the simplest technic which is that of the phthalein test. They remark in addition that this latter technic is free from the sources of error to which the others are liable. As it gives the same results as the Ambard formula they should be interpreted in the same way.

They distinguish between true azotemia, that is, retention from progressive accumulation of urea in the body fluids, and the azotemia which is merely the result of some disturbance in the excretion of urea which is borne for a long time without the urea accumulating in the body fluids. The fluctuating urea content of the blood serum in these cases is of no import for diagnosis or prognosis unless considered by means of the phthalein test or Ambard formula. This reveals the slightest upset in excretion of urea, and confirms the assumption of an underlying kidney lesion in case of incipient or abortive Bright's disease.

Revue de Médecine, Paris

July, XXXIV, No. 7, pp. 473-552

- 45 Advantages of Dried Peas and Beans in Antidiabetic Diet. (Les cures de légumes secs dans le diabète.) M. Labbé.
46 Traumatic Shock or Traumatic Asthenia. R. Benon.
47 Edema with Liver Disease. (Les hépatites hydropigènes.) P. Le Damany.
48 Sciatica from Affections of the Spinal Nerve Roots. Fine Therapeutic Effects of Mineral Mud-Baths. M. Dobrokhotoy.

Revue Médicale de la Suisse Romande, Geneva

July 20, XXXIV, No. 7, pp. 449-500

- 49 Mode of Action of Mineral Waters. de Senarclens.
50 *Ventrofixation of Retroflexed Gravid Uterus. O. J. Rapin.
51 Operative Treatment of Gonorrheal Epididymitis. C. G. Cumston.

50. **Ventrofixation of Retroflexed Gravid Uterus.**—The woman of 40 had complained for a year of symptoms suggesting retroflexion of the uterus. They had developed after a fall, and they became much aggravated by the second month of pregnancy. After failure of all other measures, Rapin slipped his hand back of the uterus through a laparotomy incision, detached numerous adhesions, brought the uterus up into place and held it with two silk sutures through the median line of the abdominal wall. Pregnancy continued unmolested to normal term.

Revue Pratique d'Obstétrique et de Gynécologie, Paris

June, XXII, No. 6, pp. 161-188

- 52 Intravenous Colloidal Metal Injections in Puerperal Fever. R. Willette.
53 Ether Dressings in Gynecology. R. Condamin.

Semaine Médicale, Paris

July 8, XXXIV, No. 27, pp. 313-324

- 54 Prevailing Views on Surgical Shock. R. de Bovis.
55 *Chronic Appendicitis and Torsion of the Omentum. F. Lejars.
July 22, No. 29, pp. 337-348
56 *Signs of Organic Hemiplegia. J. Lhermitte.

55. **Chronic Appendicitis and Torsion of Omentum.**—Lejars relates a case which shows that adhesion and partial torsion of the omentum or even of one strand of fibers may entail symptoms suggesting chronic appendicitis. The omentum trouble is generally traceable to mischief in the appendix, possibly many years before. In his case twenty-two years had elapsed after a brief and mild attack of appendicitis, leaving chronic slight tenderness, when the man of 39 suddenly developed new symptoms and the operation revealed the omentum adherent to the nearly normal appendix, the stretched adherent strip twisted several times on itself. This and the few similar cases on record teach the importance of examining the omentum even to quite a distance at all appendix operations.

56. **Signs of Organic Hemiplegia.**—Lhermitte discusses the phenomena characteristic of organic hemiplegia to which Panski, Babinski and Bergmark have recently called attention. Even although we already have many signs of organic hemiplegia, yet these *symptomes de luxe* are important not only because they aid in excluding functional trouble but also because they throw light on the pathologic physiology of the syndrome. They show that ordinary hemiplegia is an infinitely more complex manifestation than was formerly recognized. Not only the apparatus innervated by the centers in the region injured suffer from the disturbance in the centers (deficit phenomena), but other apparatus connected with them suffer likewise, either from loss of control (in which case anarchy prevails among them), or from excessive control of inhibition (phenomena of dissociation or Monakow's diaschisis). Among the comparatively new signs revealing trouble of this kind is the excessive secretion of saliva; the heavy coating of the tongue, sometimes only on the paralyzed side, profuse excretion of urea crystals stopping short at the median line, and a modified sense of taste or smell on the paralyzed side. This may be bilateral, and it may explain the loss of appetite in some cases. The sphincters may act in an anarchistic way, and enuresis may be the only sign left of a transient, possibly scarcely noticed, hemiplegia. This anarchy of the sphincter may be exaggerated or brought back by changes in temperature, by sneezing or coughing. In one case irresistible micturition occurs every time the hemiplegic takes his place at the table. Panski has also reported recently three cases in which glycosuria disappeared after organic hemiplegia developed. One woman of 60 had 5 per cent. sugar in the urine before, but there was none afterward for a year, not even after subsidence of the hemiplegia, and it did not run above 2 per cent. at any time. In the others it never reappeared, or only at long intervals. Babinski applies the term *anosognosie* to a peculiar modification of the consciousness which he has noted in two cases, namely, the complete ignoring or the semblance of completely ignoring the fact of the hemiplegia. The patients seemed absolutely unaware of their infirmity although otherwise they were intelligent.

Archiv für Gynaekologie, Berlin

CIII, No. 1, pp. 1-242. Last indexed July 4, p. 67

- 57 Infantile Hypoplasia of Uterus Frequently Masks Serious Pathologic Processes or Their Relics. (Tuberkulose; Uterusatresie und Amenorrhoe.) J. Schifmann.
58 General Anesthesia in Gynecology. H. Schlimpert. Continued.
59 Muscular Degeneration Causing Spontaneous Rupture of Uterus at Term. G. v. Mandach.
60 The Corpus Luteum in Ovulation and Menstruation. (Corpus luteum menstruationis und Corpus luteum graviditatis.) A. Marcotty.

- 61 Case of Deforming Fibrous Ostitis with Extensive Tumors in Bones. P. Sippel.
- 62 Changes in Blood during Delivery, Lactation and the First Menses Thereafter. L. Terhola.
- 63 Further Improved Technic for Treatment of Genital Prolapse. (Die Suspension der Portio vaginalis an den Sakrouterin-Ligamenten.) E. Wertheim.
- 64 Toxicity of Urine, Serum and Colostrum during Pregnancy, Delivery and the Puerperium Not Proportional to Clinical Picture in Eclampsia. P. Werner and E. Kolisch.

Berliner klinische Wochenschrift

July 20, LI, No. 29, pp. 1349-1396

- 65 Effectual Inoculation against Diphtheria. (Die Diphtherieschutzimpfung von Säuglingen nach v. Behring.) P. Rohmer.
- 66 Experimental Pneumonia. (Eine Methode zur experimentellen Erzeugung von Pneumonie und einige mit dieser Methode erzielte Ergebnisse.) S. J. Meltzer (New York).
- 67 Foerster's Operation in Treatment of Spastic Paralysis. T. Gümbel.
- 68 Residuum in Stomach Later than Six Hours with Gastric Ulcer Remote from the Pylorus. (Zur Frage des Sechsstundendrestes bei pylorusfernem Ulcus ventriculi.) Faulhaber.
- 69 Carbonated Baths. (Einige Gesichtspunkte für die Beurteilung von Kohlensäurebädern.) W. Scheffer.
- 70 Atypical Gout and Allied Metabolic Disturbances. Goldscheider. Commenced in No. 28.
- 71 Relations between the Thymus and Exophthalmic Goiter. H. Matti. Commenced in No. 28.

67. Section of Spinal Roots for Spastic Paralysis.—Gümbel has compiled 107 cases in which Foerster's operation has been done for Little's disease. The mortality was 13 per cent. He has operated himself in 8 cases, here described in detail. One patient died and the outcome was injuriously affected in one case by an intercurrent hip-joint disease. The results were disappointing in all; none of the patients is able to use his legs although painstaking after-care followed the operations. Better results are obtained in spastic paralysis with the ordinary measures. A still further drawback of the operation is that the laminectomy left a weakness of the spine. In one of his cases the tendency to curvature of the spine became much aggravated and in 2 others curvature developed in previously straight spines.

70. Disturbances Resulting from a Tendency to Atypical Gout.—The first part of Goldscheider's article was reviewed in these columns August 15, abstract 58, p. 613. He describes here a number of typical cases of atypical gout and allied metabolic disturbances all of which call for treatment similar to that for true, typical gout. The importance of the subject lies in the unrecognized or overlooked fact that a number of symptoms on the part of the nervous and circulatory systems and the kidneys are the result of metabolic disturbances analogous to or identical with those of gout. These may be due to an inherited tendency, to overwork, or to lack of exercise. Treatment of the metabolic disturbances applied in time and systematically is liable to give highly gratifying results. The groups of the atypical forms of gout include persons with a gritting noise in the joints, with or without tophi; obesity; congestion in the liver; kidney stones and gravel and nephritis. He found gout in 163 of 424 obese patients; the symptoms were much the same in all. Pains in the joints were more common in the obese with high blood-pressure. He found typical or atypical gout further in 30.1 per cent. of 232 cases of enlarged liver in the non-obese. In 4.9 per cent. there was a tendency to kidney stones, and among those with cardiovascular symptoms the proportion was 10 per cent.

It seems plausible to assume that symptoms on the part of the cardiovascular system, nerves, etc., in these cases are due to deranged or insufficient metabolism of purins or to excessive intake of purins beyond what can be properly metabolized, or to the inherited tendency underlying the constitutional obesity, or to an upset in the liver control of metabolism. Goldscheider's aim is to emphasize the importance of a deranged metabolism as a factor in cardiovascular, nervous and renal phenomena. He admits that the only proof he has to offer for some of his statements is the success of treatment based thereon.

71. The Thymus with Exophthalmic Goiter.—Matti's research and study of the literature confirm that the thymus is often directly concerned in the production of exophthalmic

goiter. The monopoly hitherto enjoyed by the thyroid is at an end. The adrenals often are insufficient in this disease and epinephrin may be indicated to prepare the patient for operative treatment. The changes in the thymus in exophthalmic goiter are not to compensate for the thyroid, but are directly coordinated with and parallel to the changes in the thyroid.

Correspondenz-Blatt für Schweizer Aerzte, Basel

July 18, XLIV, No. 29, pp. 897-928

- 72 Atrophy of the Prostate. A. Müller.
- 73 Endemic Goiter. (Zum Kropfproblem.) E. Bircher.

72. Atrophy of the Prostate.—Müller remarks that comparatively few realize that retention of urine may be the consequence of atrophy of the prostate as well as of hypertrophy. An abnormally small prostate may cause a clinical picture in every respect similar to that from enlargement of the organ. It sometimes happens that the syndrome is ascribed to nervous incompetency of the bladder as the anticipated enlargement of the prostate is not discovered. He had two typical cases of the kind which he here describes in detail and compares with analogous experiences on record. The disturbances are caused not by obstruction from enlargement of the gland but from derangement of the functioning of the bladder sphincter which is involved more or less in the shriveling process. The suprapubic incision permits better oversight and is to be preferred in these cases. Differential diagnosis is difficult mainly in that all bladder disturbances of central origin, especially tabes, have to be excluded before positively incriminating atrophy of the prostate. In some cases hypertrophy of one part was accompanied by atrophy of the rest or there may be a true miniature hypertrophy. Stretching the prostate, or the Bottini operation, or resection of the sphincter may cure the trouble after failure of medical measures. He compares the various technics in vogue, especially Young's conservative operation, which he describes in detail, remarking that he does not know of its having been applied to date to any extent in Europe.

Deutsche medizinische Wochenschrift, Berlin

July 23, XL, No. 30, pp. 1505-1552

- 74 Treatment of Acute Threatening Conditions with Pneumothorax. J. Grober.
- 75 Cultivation of Parasite of Rabies. (Züchtung des Lyssavirus nach H. Noguchi.) R. Kraus and B. Barbara.
- 76 Pharmacology of Colloid Solutions. (Die vitale Färbung mit sauren Farbstoffen in ihrer Bedeutung für pharmakologische Probleme.) H. M. Evans, W. Schulemann and F. Wilborn.
- 77 Agglutination Titer in Infectious Diseases. C. Klieneberger.
- 78 Experiences with Rosenbach's Tuberculin. A. Mayer.
- 79 Treatment of Diarrhea by Anesthetics by the Mouth. M. Henius.
- 80 Chronic Copper Poisoning from Alloy Filling of Tooth. (Chronische Kupfervergiftung durch das Tragen von schlechter Goldlegierung im Munde.) E. Harnack.
- 81 Sore Tongue and Gums as Early Symptom of Pernicious Anemia. H. Stern (New York).
- 82 The Pulse Wave with Disease of Aorta. (Brachialis-Wellenschreibung.) Engelen.
- 83 Serodiagnostics. (Untersuchungen zum Abderhaldenverfahren.) L. Nieszytko.
- 84 Induced Hardening of Ligaments Cures Flat-Foot, etc. (Gerbung der Bänder zur Heilung des Plattfusses und anderer Knochen-deformitäten.) M. Katzenstein.
- 85 Neuropathic Equivalents in Infants. M. Wilhelm.
- 86 Tests for Urine Affected by Hexamethylenamin. (Vortäuschung von Eiweiss nach Hexamethylentetramin.) J. Schumacher.

74. Threatening Conditions with Pneumothorax.—Grober does not refer to induced artificial pneumothorax but to that complicating tuberculous processes or stab wounds or other injury of the lungs, when it is important to relieve vital organs from the pressure of the air. The air must be allowed to escape only very slowly, through a puncture needle and tube into a jar of water. Dry cups may relieve pain for hours at a time, and the patient may become accustomed to his pneumothorax until it no longer distresses him. But during the acute phase opiates may be necessary. By relieving the pain they permit deeper breathing and this helps to restore the circulation. Swallowing may be impeded by the displacement of the esophagus, and special care with the food is necessary on this account. Signs of sepsis may render puncture advisable even when there are no symptoms

from compression. Heart stimulants may be usefully combined with the opiates in some cases.

77. Agglutination Titer in Infectious Diseases.—Klicenberger has encountered eight cases of typhoid in the last two years in which agglutination occurred once at 1 to 2,560; three times at 1 to 10,240; twice at 81,920 and once at 1 to 163,840. These high titers did not last over many days. In some cases of paratyphoid infection, the serum agglutinated at 1 to 81,920 and kept this up for over four months. In pyocyanus infection agglutination occurred at 1 to 40,960 in one case, but in two others only at 1 to 2,560. This same figure was obtained also in three proteus infection cases.

79. Treatment of Diarrhea by Reducing Sensitiveness of the Stomach.—Henius thinks that Fuld has hit the nail on the head by his statements in regard to "gastrogenous diarrhea," that is, diarrhea set up by a reflex action on the colon from the oversensitiveness of the stomach. Just as reflex vomiting can occur from this cause, reflex diarrhea may be started and maintained by it. Treatment should aim to soothe the irritable stomach. By deadening the sensibility of the stomach, the reflex action is arrested and the diarrhea is cured. Cocain may answer the purpose: ten drops of a 3 per cent. solution of cocain fifteen minutes before meals.

84. Treatment of Flat-Foot by Induced Shriveling of Ligaments.—Katzenstein induces hardening and shriveling of overstretched and relaxed ligaments responsible for flat-foot and other deformities. He discovered by accident the effectual action of the tanning process and then proceeded to apply it systematically. One of his cured patients is a youth of 15 who has been cured by this means of crippling and painful bilateral flat-foot disturbances. He does not even have to wear insoles now. Katzenstein uses formaldehyd for the purpose, injecting, for example, into the tibionavicular ligament from 0.5 to 1 c.c. of a weak solution of formaldehyd under local anesthesia. A plaster cast is then applied to hold the ligament in its shortened position. When the cast was removed after three or four weeks the ligament was firm and hard. He gives an illustration of an apparently almost normal child of 5 cured of extreme flat-foot and inward bowed legs. He injected the formaldehyd into the tibionavicular ligament and into the medial lateral ligament of each knee, with a plaster dressing for the three joints. He thinks that relaxed ligaments are the cause of deformity of bones far more often than is generally recognized. By detecting the loss of elasticity early it may be possible to ward off deformity and correct it by restoring the pull to the ligaments. This is a truly causal treatment of deformity and renders apparatus superfluous.

85. Neuropathic Equivalents in Infants.—Wilhelm relates the case of an infant of 8 months who died from pneumonia after an attack of diphtheria; for months previously it had had attacks of vomiting suggesting stenosis of the pylorus. As soon as the diphtheria developed, the vomiting stopped but began again after recovery, stopping anew as the pneumonia came on. Wilhelm suggests that the vomiting may have been a conditional reflex, and that this was arrested by the intercurrent disease. The vomiting occurred first in connection with some indigestion. The mother was extremely nervous and the inherited taint maintained the vomiting as a conditional reflex on the intake of food.

Jahrbuch für Kinderheilkunde, Berlin

July, LXXX, No. 1, pp. 1-132

- 87 Periodical Vomiting with Acetonemia. G. Hilliger.
88 Cause of the Physiologic Loss of Weight in the New-Born. (Physiologische Gewichtsabnahme neugeborener Kinder.) G. Benestad.
89 Adaptation of Cow's Milk for Infant Nutrition. (Versuche zur Anpassung der Kuhmilch an die Frauenmilch zu Zwecken der Säuglingsernährung.) E. Müller and E. Schloss.
90 *Development of New-Born White Rats when Separated from the Mother and Artificially Fed. H. Brüning.
91 Early Appearance of Centers of Ossification and Calcification in Hypoplastic Chondrodystrophia Fetalis. E. Conradi.

90. Development of New-Born Animals under Artificial Feeding.—Brüning found that young rats taken from the mother during the first few days of life and artificially fed

on food rich either in albumin and fat or in carbohydrates were lighter and smaller at the end of the nursing period than those left with the mothers. Artificial feeding with food rich in fat and albumin immediately after weaning caused a marked and progressive increase in weight. Food rich in carbohydrate after weaning, on the contrary, caused a decrease in weight so that the animals on the forty-second day were about the size of half-grown mice. When the latter group were placed on a mixed diet they increased in weight but did not come up to the standard of the group fed with an abundance of fats and proteins. Roentgen examination did not show any changes in the bones. The intestinal canal of the animals fed on carbohydrates showed the type of the herbivora, and that of those fed on proteins the type of the carnivora. The former have little fat tissue while the latter are quite plump. There was no marked difference in the intestinal flora of the two groups, but there was a relative scarcity of bacteria in the upper part of the intestinal tract in both groups.

Münchener medizinische Wochenschrift, Berlin

July 21, LXI, No. 29, pp. 1601-1656

- 92 *Cure of Deep-Seated Cancers by Roentgen Exposure of Surface. (Heilung tiefliegender Karzinome durch Röntgenbestrahlung von der Körperoberfläche aus.) E. Bumm and K. Warnekros.
93 Curves to Record Skin Reaction to Tuberculin Tests. (Graphische Analyse kutaner Reaktionen.) C. v. Pirquet.
94 *Clinical and Experimental Experience with Salvarsan Injected into the Central Nervous System. W. Weygandt, A. Jakob and V. Kafka.
95 Dusting Wound with Anesthetic Powder before Suturing. (Daueranästhesie.) G. Hotz.
96 *Passive Transmission of Protective Ferments in Mental Disease. A. Fauser.
97 Two-Way Retention Catheter for Continuous Irrigation of Bladder and Kidney Pelvis. E. Holzbach.
98 *Severe Intestinal and Liver Trouble Set Up by Chronic Dyspepsia. (Chronische Magen-Darmdyspepsie, Colitis gravis und Leberzirrhose.) R. Schütz.
99 Operative Treatment for Cleft Palate. (Gaumenspalte.) R. Drachter.
100 Food as Cause and Cure of Disease. (Die Ernährung als Krankheitsursache und Heilfaktor.) Schittenhelm.

92. Deep Cancers Cured by the Roentgen Rays.—Bumm and Warnekros state that after disappointing extensive trials of mesothorium and other radio-active substances, they returned to roentgenotherapy with a modified technic, and here report two years of most encouraging experiences. The secret of success, they say, is to use hard tubes, by the cross-fire technic, to generate 500 X units in the depths. As about six-sevenths of the rays applied to the surface fail to penetrate to a depth of 10 cm., fully 3,500 X units have to be applied to the skin to obtain the 500 units in the focus. They state that no serious injury results from this intensive exposure of the skin to the exclusively hard rays, even with 800 X units. At worst, the skin may blister but this heals in three or four weeks, and a month of a transient local dermatitis is not to be considered when balanced against the cure of malignant disease. Seven cases of advanced cancer of the uterine cervix, fourteen of the breast and one of the lung are reported, all showing remarkable benefit under the exposures, even the microscope confirming the complete retrogression of the cancer, as they show by slides of excised scraps. The tissues became indurated, with hyaline degeneration of the connective tissue, and there was not a trace of cancer by the fifth week in one typical case of a bleeding carcinoma in the uterine cervix, as large as a man's fist, the patient aged 37. The rays were applied externally alone, the distance from the focus 10 or 15 cm., the daily exposure totaling 60 or 80 minutes, the different fields of exposure overlapping so that each was exposed from 90 to 120 minutes. In two weeks the growth had subsided by one-half and by the end of the third week the retrogression continued spontaneously after the close of the course of treatment.

In one case the interval since treatment has been over a year and the cure has persisted to date. The patient, a woman of 42, was already in advanced cachexia with dyspnea from an inoperable recurrence of cancer of the breast. The lymph-nodes in the axilla were much enlarged, both above

and below the clavicle, and adherent. This patient returns every two or three weeks for a prophylactic exposure. One great advantage of Roentgen treatment over the knife is that any lymph-nodes involved or other metastases, feel the curative influence of the rays on their way to the deeper focus. Ovarian cancers proved the hardest to influence in their experience but fine results were obtained in 2 cases with metastases left after panhysterectomy for ovarian cancer.

94. **Intraspinal Injection of Salvarsan.**—This article reports extensive experiments on monkeys treated with neosalvarsan injected directly into the central nervous system in doses relatively much larger than are used in the clinic and three times as concentrated. One monkey by lumbar puncture was given—proportional to its weight—thirty times the amount given to patients, and yet it showed no signs of anything wrong, kept clinically healthy, and only the microscope revealed slight and circumscribed histologic changes. The dose was 3 c.c. of a 0.15 per cent. solution. With stronger solutions injected into the spinal canal or brain the nervous tissue showed signs of severe irritation, especially in the vessel walls and the glia. The monkeys injected subdurally and into the spine even with large amounts of the solution used on patients (0.15 to 300) were not affected deleteriously in the slightest and even the microscope failed to reveal the slightest change. The article is accompanied by fourteen pictures of the microscopic findings under the intensive dosage. The results of the research are very encouraging for the mild intraspinal use of neosalvarsan in Gennerich's dosage, that is, not over 6 c.c. of a 0.15 to 300 solution. (See also Berlin Letter in THE JOURNAL, June 20, p. 1979.)

96. **Passive Transmission of the Defensive Ferments.**—Fauser injected ten rabbits with serum from patients with dementia precox. The serum digested ovarian tissue or testicle tissue according as it came from a woman or man, and this discriminating property seemed to be transmitted to the rabbits' serum.

98. **Dyspepsia, Colitis and Cirrhosis of the Liver.**—Schütz gives the details of four cases in which primary dyspepsia brought on serious inflammation in the colon. A tendency to spontaneous healing was evident in two cases, showing that even quite severe bowel trouble is liable to retrogress spontaneously. This explains the occasional appearance of pus in the stools of patients with dyspepsia who yet never develop severe enteritis; a mild attack passes over undetected. The modification of the intestinal flora by the abnormal digestive processes may be the chief factor in the colitis.

Zeitschrift für Kinderheilkunde, Berlin

July, XI, No. 4, pp. 267-336. Last indexed Aug. 22, p. 713

- 101 The Relation of Measles to Other Pathologic Processes. H. Koch.
- 102 Slight Erythrocyturia in Infancy and Childhood. Castro.
- 103 The Acidity of the Stomach Contents in Infancy and Childhood on Milk and Meat Test Diets. E. J. Huenekeus.
- 104 Relation of the Heart Muscle to Spasmophilia in Early Childhood. K. Morgenstern.
- 105 Relation of Chronic Deficient Nourishment to Infection and the Clinical Signs of Decreased Immunity. E. Thomas.
- 106 Congenital Edema from Lymphangiectasis. B. Erlanger.

Zentralblatt für Gynäkologie, Leipsic

July 25, XXXVIII, No. 30, pp. 1049-1088

- 107 Conservative Treatment of Umbilical Hernia in the New-Born. (Heilung von Nabelschnurbrüchen.) F. Ahlfeld.
- 108 The Intra-Uterine Pessary in Treatment of Amenorrhea. (Zur Therapie der Amenorrhöe: Ein Wort für den Intrauterinstift.) Rieck.

Gazzetta degli Ospedali e delle Cliniche, Milan

July 19, XXXV, No. 86, pp. 897-912

- 109 Atypical Typhoid Fever. I. Illuminati.
- July 21, No. 87, pp. 913-920
- 110 Exophthalmos as Early Sign of Meningitis. M. Zannini.

Rivista Ospedaliera, Rome

July 30, IV, No. 12, pp. 561-608

- 111 *Mercury Test for Tuberculous Nature of Effusion. (La reazione di Morelli negli esudati pleurici di natura tubercolare.) M. Zannini.

112 *Spastic Ileus. G. Cauli.

113 Ambard's Formula for Recording Functional Capacity of the Kidneys. (Cio che deve la chirurgia urinaria alla costante di Ambard.) R. Bastianelli.

111. **Mercury Test for Effusions.**—Zannini has been giving Morelli's test a thorough trial and found it extremely simple and reliable. He applied it in 13 cases of transudate and 35 of effusions, comparing the findings with those of the Rivalta test. In the 35 cases of effusions the Rivalta test was positive in all, but the Morelli test was negative in 15. Everything in these cases indicated a tuberculous process, confirming Morelli's assertion that effusions of tuberculous origin always respond negatively to the test. It is made by dropping three or four drops of the fluid into a glass filled with a saturated solution of mercuric chlorid. If the fluid is an effusion, a yellowish ring of mercury albuminate will form on the surface; it will either adhere to the walls of the vessel or it will sink to the bottom whole. This is the positive reaction. If the fluid is a transudate instead of an effusion, the mercury acting on the albumin forms numerous small flakes or granules which sink thus segregated to the bottom. This is the negative reaction.

112. **Spastic Ileus.**—Cauli discusses the present status of the conception of ileus from spasmodic contraction of some segment of the intestine and reports a case from his own practice. His patient was a robust boy of 17 with no pathologic antecedents. After ten days without bowel movement; he developed severe abdominal pain and vomited incessantly. There did not seem to be any specially tender points but sometimes the pain seemed more intense to the right, below the umbilicus, and sometimes more in the left iliac fossa. He could not retain even a sip of ice water, and during the paroxysms of pain the pulse was small and frequent, the face drawn. After four days of these symptoms there came a lull, the lad feeling very much better and getting up, but the bowels did not move and he continued to vomit. No effect was realized from morphin and enemas and the pains returned, becoming so intense that operative relief became imperative. Nothing pathologic was found at the laparotomy except that the small intestine over a stretch 20 cm. long was contracted and also the descending colon and flexure, the segment not larger in diameter than one's little finger. Otherwise the viscera seemed normal; the intestines above the contracted segments were not much dilated. The abdomen was sutured without further intervention and the vomiting ceased and bowel functioning was restored after a few days.

Two days after his discharge from the hospital he returned with his old symptoms but in a milder form; he was kept under observation for a few weeks during which periods of complete well being alternated with periods of vomiting but the intestines moved freely. Treatment included opiates, atropin, hot applications and suggestion. No effect from the atropin could be detected. By the end of the sixth week after the first appearance of symptoms he was apparently entirely cured and has had no signs of trouble since. The good general condition during the intervals between the attacks of pain was noticeable; even when the vomiting and the occlusion of the bowels kept up, yet the lad felt well and his pulse was good during the intervals. This is the opposite to what is observed with true ileus.

Hospitalstidende, Copenhagen

July 15, LVII, No. 28, pp. 865-888

- 114 Necessity for Interrupting Pregnancy on Account of Progressing Pulmonary Tuberculosis; Six Cases. (Abortus provocatus ved Lungetuberkulose.) G. E. Permin.

Svenska Läkaresällskapets Handlingar, Stockholm

XL, No. 2, pp. 133-215

- 115 Criminal Responsibility. (Om den s. k. tillräkneligheten.) O. Kinberg.
- 116 Hemorrhagic Leptomeningitis from Anthrax Bacilli. H. Berglund.

Ugeskrift for Læger, Copenhagen

July 23, LXXVI, No. 30, pp. 1319-1362

- 117 Typical Roentgen-Ray Findings with Gastric Cancer. (Ventrikelcarcinomet i typiske Röntgenbilleder.) T. E. H. Thaysen.

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A FEW POINTS OF PRACTICAL IMPORTANCE IN OBSTETRICS, GYNECOLOGY AND ABDOMINAL SURGERY*

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The prodigious advancement made in medicine and surgery during the past forty years has made it impossible for one mind to master every department pertaining to the study and practice of our profession. To be as nearly perfect in one department, and to know as much of each of the other branches as time, talent and circumstances will permit, is all the ablest of us can do.

In this Section our attention is limited to obstetrics, gynecology and abdominal surgery. It takes a capable man to be master of one of these branches, but a far more able man to be master of all three. It is the object of your chairman to dwell briefly on a few important points in each, namely, intestinal stasis, painless operations, Roentgen-ray therapy in gynecology and abdominal surgery, the curative effect of radium, the Percy treatment of inoperable carcinoma uteri, the compromise operations of obstetrics, the treatment of placenta praevia, and surgery in the treatment of puerperal eclampsia.

INTESTINAL STASIS

This is unquestionably one of the most important subjects before the medical profession to-day and it is, to a large extent, for the abdominal surgeon to solve most of the details of this comparatively new phase of an old problem, and to corroborate, as far as possible, the epoch-making work and teachings of Sir Arbuthnot Lane. In his address, delivered at the North-East London Post-Graduate College, Nov. 1, 1913, Lane¹ says:

By chronic intestinal stasis I mean that the passage of the contents of the intestinal canal is delayed sufficiently long to result in the production, in the small intestine especially, of an excess of toxic material, and in the absorption into the circulation of a greater quantity of poisonous products than the organs which convert and excrete them are able to deal with.

In consequence there exist in the circulation materials which produce degenerative changes in every single tissue of the body or which lower its resisting power against invasion by deleterious organisms.

Perhaps the best scientific confirmatory evidence I can put forward of the harmful effect of defective drainage, both of

the body as a whole and of the several tissues which contribute to it, has been afforded recently by the remarkable experiments of Carrel in the growth of living tissue, in which he has shown that tissues are immortal, and grow to the greatest advantage if the drainage of their toxic products is carried out effectually.

Owing to unsuitable diet in infancy and to the habitual assumption of the erect position, delay of fecal material takes place in the large bowel, or cesspool, of the gastro-intestinal tract, or, as it can be best described, the "general drainage system of the body." In consequence of this, new membranes or resistances to downward displacement are formed by the crystallization of lines of force upon the surface of the peritoneum along which strain is especially exerted.

Thus he explains the formation of the "bands," "kinks," "folds," "veils" and "membranes" to which his own name and that of Jackson, Treves, Reid and of Jonnesco and Juvara, have been attached. It is the formation of these new structures which explains the occurrence of stricture of the bowels, of appendicitis, of disease of the ovaries, of cancer of the cecum and of the rectum. It further serves to solve the mystery of elongation and dilatation of the duodenum, the spasmodic contraction of the pylorus, the consequent dilatation of the stomach from accumulation of its contents, and the "cardiospasm" of Plummer.

More than this, the changes mentioned above may terminate in ulceration and perforation about the pylorus and lesser curvature of the stomach and even cancer of this organ may result. Or changes may produce infection of the liver and gall-bladder, or lead to the formation of gall-stones, cholecystitis or malignant degeneration.

Other symptoms enumerated by Lane are: the loss of fat; wasting of muscles; degenerative changes in the skin with alteration of its texture and color; the temperature, in uncomplicated cases, is subnormal; stasis always exists in Raynaud's disease; there is mental apathy, stupidity or misery and, occasionally, melancholia or even imbecility and suicidal tendency. Neuralgia and neuritis are frequent; epileptiform tic and headaches are often present; want of control of temper which may lead to misery or even crime. Patients complain of rheumatoid aches and pains in muscles and joints; the thyroid gland wastes; the blood-pressure may be raised or depressed; the breasts show degenerative changes and cancer readily develops in them. Organs prolapse and change in size, shape and weight. The patient becomes short of breath on exertion, resembling asthma; but this may be due to distention of stomach or intestines interfering with the action of the heart. Most of the degenerative changes affecting the heart appear to be due to auto-intoxication. The kidneys may become affected. The hair of the head loses color early and

* Chairman's address, read before the Section on Obstetrics and Gynecology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, June, 1914.

1. Lane, Sir W. Arbuthnot: On Chronic Intestinal Stasis, Brit. Med. Jour., Nov. 1, 1913.

falls out; hair grows in places in which it is ordinarily inconspicuous or absent. The pancreas becomes infected from stasis of the duodenum, resulting in chronic induration, inflammation and finally cancer of this organ. Pancreatic diabetes may ensue. Degenerative diseases of the eye are produced and vary with the degree of auto-intoxication.

According to Lane, the direct changes resulting from the lowered resisting power of the tissues, produced by auto-intoxication, are: infection of the gum, causing pyorrhea alveolaris; tuberculous infection, not produced by direct inoculation; rheumatoid arthritis, which cannot develop except in the presence of defective drainage of the gastro-intestinal tract; infection, directly or indirectly, of the genito-urinary tract, through the blood-stream (by organisms other than tubercle) producing nephritis, cystitis, pyelitis, endometritis, salpingitis, etc.; development of adenomatous tumors in the thyroid gland, or general enlargement of this organ, or of exophthalmic goiter; Still's disease; infections of the skin of a pustular nature; infections of the large intestine by organisms which produce the several varieties of mucous and ulcerative colitis; and ulcerative endocarditis.

Lane states that he has "chosen merely a few obvious, typical, indirect results of the auto-intoxication of chronic intestinal stasis" and that "the point of practical interest . . . is that the drainage scheme be made to work efficiently . . . by mechanical means or by operative interference, and that the resisting power of the tissues of the body is such that they can destroy the organisms or poisons, if not advanced too far or if cancer has not developed;" and, "nothing is more remarkable in the whole range of surgery than the result of the removal of the large bowel in a case of rheumatoid arthritis. The transition is abrupt and startling."

The treatment varies: The non-operative treatment consists in the use of paraffin oil before each meal, the application of a spring support to the abdomen below the umbilicus to keep up the "transverse colon, cecum and other prolapsed viscera," and "to put into the stomach as little food as is likely to decompose and become poisonous in its passage through the intestines."

Operative treatment is resorted to only when the above or other modes of treatment fail and may necessitate the removal of the appendix when it interferes with the lumen of the ileum; or to "short-circuit" the bowel, by dividing the ileum and putting it into the pelvic colon. If the colon is freely movable and pendulous, Lane always removes it down to its junction with the sigmoid; his rule is: *Remove the large bowel, if it may be easily effected, if not, be satisfied with ileocolostomy. Gastro-enterostomy for duodenal distention, even if there is ulceration, is, in Lane's opinion, both unnecessary and harmful. If the ulceration has caused considerable reduction of the lumen of the pylorus, he resorts to gastro-enterostomy. Lane also performs gastro-enterostomy in ulceration of the stomach (in the absence of cancer) in addition to short-circuiting, with or without colectomy. He thus removes the strain from the lesser curve, effectually draining the stomach.*

Those who have carefully studied Lane's work on intestinal stasis, and the case reports of him and his followers, can only help but be profoundly impressed

by the reports of the results obtained from the operations of gastro-enterostomy, ileocolostomy or colectomy, or of all three, whether in the same subject at the same time or at different times. The profession is by no means unanimous in its opinion as to the real necessity of these heroic operative procedures for the relief of chronic intestinal stasis. Deeper delving and further investigations on the part of the internist and the abdominal surgeon alone will solve the problem.

PAINLESS OPERATIONS

Crile's kinetic theory of shock and its prevention through anoci-association² has found favor with many surgeons. There are, however, not a few who are averse to Crile's new method. The objections most writers offer are, that the time lost in making the injections of novocain and quinin-urea-hydrochlorid is considerable, that the abdominal walls remain more or less rigid, and that the numerous and extensive injections of both drugs, necessary to anesthetize the field of operation, have a tendency to devitalize the structures involved and thus cause delay in union of the parts as well as create a predisposition to the formation of stitch-hole abscesses. Many admit, however, that "anoci-association" is an ideal and practical method. The most serious operations may be performed without the slightest pain and with total absence of shock, while the clinical results, which Crile and his associates have obtained, leave naught to be desired. In 1908 their mortality was a fraction over 4 per cent.; in the last 1,000 operations (not selected cases) the mortality was reduced to 0.8 per cent. These figures speak for themselves and are deserving of serious consideration.

ROENTGEN-RAY THERAPY IN GYNECOLOGY AND ABDOMINAL SURGERY

Many of our surgeons look on roentgenotherapy as the sovereign remedy in uncomplicated cases of uterine hemorrhages. Since, however, in the opinion of some writers, the cure is obtained solely through the destruction of the ovarian follicles, they caution against the use of the Roentgen rays in young and nervous women. Others maintain that in young women the amenorrhea which follows the application of the Roentgen rays, is only transitory; that a permanent sterilization is almost impossible; that in women near the menopause active follicles are rarely present, and destruction of the ovaries is only a precursor to the climacteric period. The appellation, "Roentgen castration," is therefore, a misnomer and incomparable to surgical castration.

The experience of Bumm, Krönig,³ Gaus, Döderlein, Kelly, Burnam, and others with the effects of Roentgen rays on fibroid tumors of the uterus show that uterine hemorrhage may be successfully arrested; that, frequently, the tumors diminish in size; occasionally, even a cure may be effected, though not infrequently, the tumors remain as large as before. All agree that a timely myomectomy or hysterectomy yields the most satisfactory result. The administration of the Roentgen rays is limited to those cases in which extirpation of the tumor, or of the uterus, is inadvisable and relief from hemorrhage or other symptoms alone is sought.

2. Crile, George W.: The Kinetic Theory of Shock and Its Prevention through Anoci-Association (Shockless Operation), Cleveland Med. Jour., 1913, xii, 513.

3. Krönig, B.: Die Strahlentherapie in d. Gynäkologie, Strahlentherap., 1913, v, No. 2.

THE CURATIVE EFFECT OF RADIUM

The curative effect of radium on malignant disease has been vigorously assailed. Judging from the good results obtained from radium, mesothorium and the Roentgen rays, in the hands of such men as Krönig, Gaus, Döderlein, Dominici, Kelly, Burnam, Park, Parker Syms,⁴ and the Ransohoffs, as well as my observations in my own cases and those of others, the scathing adverse criticism of recent date seems uncalled-for and wholly unjustifiable. Some of the favorable results obtained, especially those from radium and mesothorium, are definite and unmistakable; and while it is, perhaps, too soon to speak of the good achieved with these remedies in terms positive and absolute, it is neither fair nor just to condemn them unqualifiedly.

For the present we know that in all operative cases the knife is the best agent for combating malignant disease; and that radium, mesothorium, as well as the Roentgen ray, have proved of unexpected value in some of the inoperable cases, as well as in some of the superficial forms of cancer. Therefore, it behooves us to encourage the work of those who have occupied themselves with determining the value of these remedies in the treatment of malignant disease.

THE PERCY TREATMENT OF INOPERABLE CARCINOMA UTERI

I feel it obligatory to speak a word in favor of this treatment of inoperable carcinoma uteri. Since witnessing the work of Percy in Chicago last fall, I have had an opportunity of seeing two cases of inoperable cancer of the uterus.

In one, Mrs. X, aged 48, coming into my care Nov. 15, 1913, the actual cautery (Percy method without opening the abdominal cavity) was used five different times at intervals of one week, two weeks and four weeks. At the end of that time only a small portion of the body of the uterus remained, and the vagina with the region formerly occupied by the cervix and lower uterine segment, appeared perfectly healthy, but an offensive watery vaginal discharge continued. The patient then received, at intervals of one week, three applications of radium (80 mg.) by Dr. Louis Ransohoff. The result was most marked and highly satisfactory. What there was left of indurated tissue in the vaginal vault, tenderness of the parts and of offensive discharge, disappeared promptly; the patient gained rapidly in weight, and is to-day, so far as the eye can see and the finger can feel, in every respect a healthy woman. Within the last seven weeks she has gained 20 pounds.

The other, Mrs. Y., aged 35, was first seen about the middle of March. This, too, was an inoperable case of carcinoma uteri. Up to this time the Percy method (not opening the abdomen) has been employed three times with, apparently, the same satisfactory results as in the first case. She is now ready for the radium treatment.

THE COMPROMISE OPERATIONS OF OBSTETRICS: THE INDUCTION OF PREMATURE LABOR, THE USE OF THE HIGH FORCEPS, VERSION AND EMBRYOTOMY ON THE LIVING CHILD

In considering the so-called compromise operations, my sole object is to awaken an interest in the new therapy of narrow and contracted pelvis which, after

the doctrine of narrow pelvis had been formulated by Litzmann and Michaelis of Kiel, has been so beautifully worked out by German obstetricians. Briefly stated, this new treatment consists of the test of labor, hebosteotomy, symphyseotomy, or abdominal cesarean section.

The hope has been expressed that the induction of premature labor, the application of the high forceps to a floating head above the pelvic brim, version, or embryotomy on a living child, might be, eventually, eliminated from obstetric practice. This hope has been realized only to a limited extent.

The induction of premature labor is to-day as popular in England as ever and is more favored in some parts of Germany. The high forceps continues, more or less, in favor in France and in this country, and version still enjoys well-deserved popularity. Aseptic midwifery and a more intelligent care of the premature infant have considerably reduced the maternal as well as fetal mortality of artificial labor. Asepsis in the use of high forceps or version has also been of value, though the maternal and fetal mortality has not, thereby, been markedly reduced.

The application of forceps to a freely floating head above the pelvic inlet, or to a head which will not engage, but steadily remains above the brim, is, with the knowledge of to-day, no longer considered good practice. A judicious perseverance in the use of high forceps in cases in which the os is fully dilated, the membranes ruptured and the head fixed at the inlet, is justifiable; but great care must be exercised to avoid injury to the child's head and damage to the soft parts of the mother. Prolonged and violent traction on the head, and the repeated introduction of the forceps by the same attendant or by different operators, cannot be too severely condemned.

Embryotomy on a living child can be regarded as justifiable only in cases of excessive hydrocephalus, extensive spina bifida, double monsters or when the fetal head is impacted in the pelvis and the child's life already seriously endangered, or when there is risk of rupture of the uterus, as in a case of impacted shoulder with excessive attenuation of the lower uterine segment and marked retraction of the contracted fundus. In most of these cases, version is impossible without rupture of the uterus.

Version is justifiable only in those instances in which the head is fixed on the brim of the pelvis, the mother's soft parts are uninjured, the uterus not over-distended, and a reasonable trial of the forceps have failed to deliver. (Early external, or combined version on the head or feet, as in transverse or oblique presentations, is not included here.)

The new therapy of narrow pelvis means: Send your patient to a hospital before labor begins, and give her the benefit of the test-of-labor; if this fails, perform hebosteotomy or, if need be, cesarean section. Under this management 80 per cent. of more than 30,000 patients with narrow pelvis have delivered themselves spontaneously; 15 per cent. of the patients have required hebosteotomy, and in only 5 per cent. was a cesarean section necessary. In all the maternal mortality was 0.1 per cent., and the fetal mortality about 4 per cent.

THE TREATMENT OF PLACENTA PRAEVIA

This is still an open question. Those who advocate abdominal cesarean section in every case of placenta praevia are as mistaken as those who will not admit

4. Syms, Parker: The Prevention and Cure of Cancer, New York State Med. Jour., May, 1913.

that hysterotomy is ever necessary in this condition. The great majority of cases of placenta praevia, it is true, may be favorably treated by the use of the tampon, the rubber dilator, version or slow extraction of the child, so far as the mother is concerned. Not so with the child; the majority, or at least a very large percentage, of the children perish under this treatment. In my opinion abdominal hysterotomy is indicated in every case of placenta praevia in which the hemorrhage cannot be controlled, no matter what the condition of the cervix, the character of the child's presentation or the location of placental implantation. Thus, if the placenta has developed normally, the hemorrhage from a placenta praevia centralis may be readily controlled if the os is dilatable, and the presentation vertex or breech; but hemorrhage may be difficult or impossible of control in a case of placenta praevia lateralis, marginalis or partialis, if the placenta is abnormally developed (for instance when the chorionic villi have penetrated the muscularis) and when, in connection with this condition, the cervix is elongated or the os very rigid, and the presentation of the child such that a correctly placed tampon or the insertion of a rubber balloon will neither control the loss of blood, nor cause obliteration of the cervix or dilatation of the os. Of those obstetricians who put so much stress on the importance of the life of the child when advocating cesarean section for eclampsia, yet strenuously argue against cesarean section in the treatment of certain forms of placenta praevia, permit me to ask: Is not the life of the child to be considered as much, and even more, in cases of placenta praevia than in eclampsia? The child delivered through the abdomen in a case of placenta praevia has a far better chance for life than one born in the same manner in eclampsia.

THE MERITS OF SURGERY IN THE MANAGEMENT OF PUERPERAL ECLAMPSIA

In a recently published paper on eclampsia, read in New York,⁵ we read the following: "The practitioner who seeks to learn from medical literature how the toxemias of pregnancy are best treated, may well feel that he has authority for the most radical treatment on the one hand and for shameful neglect of the patient's interest on the other."

In April, 1913, two papers on the treatment of eclampsia were read before the New York State Medical Society. One advocated vaginal cesarean section as one of the methods of emptying the uterus in the treatment of this disease, and the other maintained that the medical care of puerperal convulsions has given the best results, so far as the mother is concerned.

The writer of the more recently published article refers to these two papers as follows:

Any one reading those two papers on eclampsia would be in serious doubt as to how to treat a case of toxemia, because he is told on the one hand that the only real hope for the eclamptic patient lies in the immediate emptying of the uterus, although a number will die in spite of this treatment, and on the other hand he is assured that the only safe method of treatment of eclampsia is by purely medical means, though a certain number of patients, approximately the same, will be lost by following this method.⁶

The author of the paper of recent date, just referred to, does not quote a single sentence from either paper

to which he alludes. This we may readily pardon; but when, carelessly or wilfully, misrepresentation is added to seemingly specious argument, it must be corrected. Personally, I welcome and always respectfully consider the severest criticism, and, as this subject is of the greatest importance to child-bearing women, I regard it as my solemn duty to make the correction on this most auspicious occasion.

The author in question states that "*approximately the same number of patients die*" when treated by "*purely medical means*" as when subjected to "*the immediate emptying of the uterus.*" In my paper, to which this writer unquestionably refers, conclusive proof is furnished that, under strictly medical treatment, the collective maternal mortality is really less than 13 per cent., and that the most favorable statistics of the maternal mortality of eclampsia, when surgical means have been employed, do not fall below 28 per cent. No effort is made to prove my statements incorrect; and yet this writer has the temerity to state in the same paper that "*the published results of a large number of cases*" (of eclampsia) "*in which the abdominal cesarean section has been performed, show that the maternal mortality runs somewhere between 40 and 50 per cent.*"⁶

My own paper⁷ on eclampsia, read at Rochester before the New York State Medical Society, in 1913, is an earnest protest against the immediate emptying of the uterus after the first convulsion, or the indiscriminate performance of cesarean section, to the exclusion of every other means, for the relief of puerperal toxemia. The arguments brought forth in my paper have not been refuted, and I reiterate: *Up to the present time, we have no better means of combating puerperal eclampsia than by the hypodermatic use of large doses of veratrum viride, free saline catharsis, hot baths or packs, strict milk diet and, if the patient be in labor, to facilitate its progress with or without the aid of the forceps or version on the feet.* Seeing is believing. Try this treatment and you will be convinced! Let us seek triumph only in truth!

Peterson's⁸ last paper on abdominal cesarean section for eclampsia, appeared in the last issue of the *American Journal of Obstetrics*. Like all of his literary efforts, this paper again reveals his enormous capacity for work, and that he has plenty of time in which to do it. In this paper he furnishes the statistical evidence that the maternal mortality of puerperal eclampsia may be reduced to a little less than 13 per cent. when abdominal cesarean section is performed early; in other words, the maternal mortality of this disease can be made as low with abdominal hysterotomy as when treated by purely medical means.

For the sake of argument, and for the sake of argument only, this statement is accepted. It alone is sufficient to demonstrate that Peterson has, virtually, solved the problem in favor of the medical treatment of eclampsia. Who will now advocate abdominal cesarean section in every case of puerperal convulsions, if the same—and even better results—can be obtained with medical care?

4 West Seventh Street.

7. Zinke, E. Gustav: A Critical Review of the Medical and Surgical Treatment of Puerperal Eclampsia, *Am. Jour. Obstet.*, 1913, lxvii, No. 6.

8. Peterson, Reuben: A Critical Review of 500 Published and Unpublished Cases of Abdominal Cesarean Section for Eclampsia, *Am. Jour. of Obst.*, June, 1914.

5. *Bull. New York Lying-In Hosp.*, January, 1914.
6. Italics my own.

NEWER POINTS OF VIEW REGARDING THE
PART PLAYED BY DIFFERENT
FOOD SUBSTANCES IN
NUTRITION*

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For the continued performance of their physiologic functions and for the maintenance of their material integrity, living organisms are dependent on an adequate supply of suitable nutrients. Their needs in this respect are evidently not uniform at all times. Periods of growth and development, of convalescence and repair, determine special requirements that are not encountered at other epochs in the life-cycle, just as rest and activity alternate in making unlike demands on the organism during the routine of each day. It was realized, long ago, that these varied manifestations of the bodily mechanism may create specific demands in respect to the food substances; but it was a forlorn hope to expect to penetrate far into the mysteries of nutrition until some definite and fairly comprehensive knowledge regarding the chemical make-up of the products taken into the body as food had been unveiled. An elementary understanding of the fate of the fats and carbohydrates came earliest, because these foodstuffs were the first to have their chemical constitution unraveled. The story of the metabolism of the protein substances is only now beginning to keep pace with the newer knowledge of the structure of these highly complex nitrogenous compounds, and there are chapters bearing on numerous other factors in the food intake—on the place of the inorganic salts, the lipoids and diverse accessory features in the dietary—that still remain to be written even in their broadest outlines.

To speak of "newer" points of view regarding the rôle of the different food substances in nutrition, as I am expected to do, implies a contrast of to-day with yesterday in this progressive domain of physiology. One need not turn back far to reach the days of Liebig, to whom, above all others, are due the beginnings of present-day knowledge of the constitution of foods, tissues and excreta. In Moleschott's popular "Physiologie der Nahrungsmittel," published in 1859, the chief concern of nutrition was portrayed as the production of good blood. He wrote:

One of the foremost questions which humanity will always address to the physician, is how good, healthy blood, capable of development, can be attained. And, modify the inquiry as they will, all those who are concerned therewith are forced by experience to admit, whether it be frankly or with reserve, that our thoughts and our loves, our children and our powers depend on our blood—and our blood on food.

Accordingly, Moleschott further maintained that vigorous nutrition is the consequence of efficient formation of blood; so far as the latter process means an enrichment of the circulating fluid in protein substances, the vigorous nutrition would express itself, above all, in the muscular tissues. "The more meats, legumes and cereals are consumed and digested," says Moleschott, "the plumper are the muscles, the firmer

their fibers, the more powerful their action." Other diets, of rice, or vegetables, or fish, were pictured as leading to an enfeebled musculature. For the fats and carbohydrates there were known depots other than the muscles. Not until the work of Carl Voit was the principle of nitrogenous equilibrium definitely established for the animal body.

The vague and indefinite generalizations of a generation ago in respect to the functions of the food-stuffs have slowly been transformed into the more tangible theories and suggestive hypotheses of the passing decade. To give you some more concrete ideas of what these changes have involved I may refer to the teaching current in my own student days, more particularly as it is related to nitrogenous metabolism. Sir Michael Foster wrote in 1891: "At all events the greater part of the proteid material of the food enters the blood as proteid material, either as peptone or in some other form, and is carried as proteid material to the tissues." The latest dictum respecting this phase of absorption presents an entirely different point of view. Proteins are now understood to be disintegrated in the digestive tract into relatively simple nitrogenous fragments, the amino-acids, not exceeding twenty in number. It is these digestion products, absorbed into the blood-stream and now demonstrated beyond peradventure to be present there, that represent the real form in which the protein intake of the body is transported throughout the organism. Protein metabolism has at length become essentially a question of the behavior of amino-acids in the body—their uses and fate.

So far as the nitrogenous transformations are concerned, the amino-acids are the center of interest in nutrition, the pivot about which the modern conceptions turn. For him who would understand the real significance of the proteins in the functions of the organism there is no escape from the necessity of appreciating clearly the nature of the amino-acids—those derivatives which arise when, either in the laboratory of the chemist or in the alimentary processes of digestion, albuminous substances are disintegrated. A generation ago it was the superficial distinctions between animal and vegetable proteins, between albumins and globulins and albuminoids that formed the basis for discussions of relative nutritive merit. To-day we are more concerned with the question whether this or that protein, whatever its biologic origin, will yield the characteristic, desired amino-acids, such as tyrosin and tryptophan, leucin and lysin, glycocoll and cystin, histidin and arginin. Our attention is fixed on the building-stones or units out of which the great protein structures are put together.

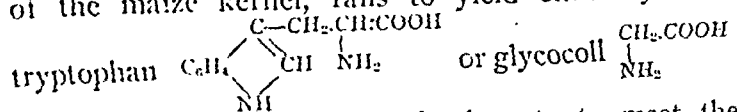
Instead of referring to the proteins in terms of their physical properties or empirical composition—their content of carbon, hydrogen, oxygen, nitrogen or sulphur—at least so far as the problems of nutrition are involved, the time has arrived for estimating their behavior in the organism on the basis of the quota of each of about eighteen well-defined amino-acids which the individual representatives of this group of food-stuffs can yield. Most, if not all, of these amino-acids are essential for the construction of tissue and the regeneration of cellular losses. In proportion as any specific protein can furnish these constructive units it may satisfy the nutritive needs of the body. The efficiency of the individual protein in this respect must depend on the minimum of any indispensable amino-

* Read at the joint meeting of the Section on Practice of Medicine and the Section on Pathology and Physiology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

acid that it will yield; for it is now known that some of them cannot be synthesized anew by the animal organism. If, for example, a protein or mixture of proteins comparatively deficient in their yield of the sulphur-containing amino-acid cystin be furnished alone to supply the body's nitrogenous requirement, the production of new, cystin-yielding molecules of protein will be limited by the amount which is available in the diet. An excess need not be wasted, for it can be burned up like sugar or fat to provide energy; but new construction or growth is limited by the minimum of the essential unit.

Although a supply of all or most of the characteristic amino-acids derived from typical proteins is essential for the construction of new tissue or the repair of the old, it by no means follows that all of them are inevitably needed in the ordinary function of maintenance, that aspect of nutrition characterized by the preservation of unchanged body-weight in the adult from day to day. Nevertheless, certain amino-acids are absolutely indispensable even in maintenance. This is well shown in recent observations conducted by Osborne and myself under the auspices of the Carnegie Institution of Washington. We have succeeded in keeping small animals (albino rats) during long periods on mixtures of isolated protein, fats, carbohydrates and inorganic salts as they are present in the protein-free fractions of milk. The advantage of this experimental procedure lies in the fact that it is possible to test, as we have done, the nutrient efficacy of individual proteins. The upshot of our now extensive experience has been to demonstrate pronounced differences in proteins from different sources. Some, like the proteins of milk, the edestin of hemp-seed, the albumin of egg-white, are individually capable of satisfying the nitrogenous needs of the body at all stages of its development. Chemical analysis has disclosed the potential existence of most of the familiar amino-acid groups in each of these protein complexes. When the gliadin of wheat, a prominent protein of this seed, is fed as the sole protein, adult animals are suitably maintained; but growing animals cease to increase in body-weight, remaining in nutritive equilibrium without growth, unless the amino-acid lysin $\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}(\text{NH}_2)\text{COOH}$ is added to the gliadin-food.

Thereupon growth is promptly resumed. The explanation becomes apparent in the fact that gliadin is almost entirely devoid of the lysin radical; and inasmuch as this is obviously needed for new protein construction, growth cannot proceed until the missing unit is supplied. Again, zein, the most conspicuous protein of the maize kernel, fails to yield either lysin or



and accordingly is entirely inadequate to meet the nitrogenous needs of animals in respect to either maintenance or growth. It may be fed in the greatest abundance; yet the animals decline in health unless the zein is supplemented by some more perfect protein. If the amino-acid tryptophan is added to the imperfect maize protein, maintenance of body-weight, without growth, is promptly established. Evidently tryptophan is indispensable for some physiologic function quite apart from increase in tissue substance. If both tryptophan and lysin are added to the zein, the diet thereupon becomes suitable for growth. In

glycocoll, likewise missing in zein as in several other proteins, we have an instance of an amino-acid which can undoubtedly be manufactured when it is needed. From these facts it is apparent how essential certain amino-acids are in the nutritive processes and how unable the body is to synthesize some of these anew.

I trust that this hasty review has given emphasis to the contention that the problem of protein metabolism has largely become one of amino-acid supply. Provided only that they are rendered free and available by the digestive processes, the body cares little whence its amino-acids are obtained. Meat proteins, egg proteins, cereal proteins—all serve in the same sense. Indeed, the amino-acids themselves, isolated in the chemical laboratory, appear to be equally available. We begin to understand why a diet largely made up of corn with its abundance of the imperfect zein and its relative poverty in more complete proteins may be poorly suited for growing individuals; why corn is so advantageously supplemented by a little skimmed milk with its casein and lactalbumin; why gelatin, which does not yield tyrosin, tryptophan or cystin, fails by itself to meet the demands of the body for nitrogenous pabulum; why a low intake of a suitable protein may be infinitely more advantageous to nutrition than a surfeit of an "incomplete" protein.

Nor is the story of the rise of the physiology of the amino-acids ended here. These compounds furnish a superior medium for the growth of bacteria, not infrequently yielding products of pronounced toxicity or pharmacologic potency. A series of amines ranging from simple forms to complex types owe their origin to the action of micro-organisms on proteins, both outside of the body and within the alimentary tract. Putrescin, cadaverin, tyramin, histamin are derived from the amino-acids arginin, lysin, tyrosin and histidin, respectively. Likewise the widely vaunted alimentary offenders, indol and skatol, are chargeable to the putrefaction of the tryptophan group in the protein molecule; phenol and cresol are similarly derived from tyrosin. Thus many of that vague and heterogeneous collection of compounds once convincingly included in the indefinite expression "ptomaines" are doubtless nothing else than the fragments of amino-acids that have fallen sacrifice to bacteria before they could be absorbed intact into the bloodstream. Now that the production of these more or less toxic amines and alcohols is clearly referable to the action of known types of bacteria on individual amino-acids, the way to avert the malaise or more serious consequences with which the putrefaction products are so often charged may be a step nearer. Gelatin, for example, furnishes no tryptophan, tyrosin or cystin; the intestinal bacteria are therefore unable to liberate indol, phenol, hydrogen sulphid or mercaptans from it.

To still another domain the discovery of the amino-acid structure of the proteins has admitted fresh rays of light. The phenomena of immunity, creating almost an entire new science of immunology; the precipitin reactions; anaphylaxis and its varied manifestations—all of these point to the participation of proteins; and, what is more significant, owing to the highly specific character of the responses, they postulate the existence of individual proteins in numbers far exceeding the possibilities suggested by the ordinary criteria of individuality. How are we to conceive of a hundred

or a thousand specific albumins from as many tissues and individuals? We need merely grasp the convenient hypothesis furnished by our knowledge of the amino-acids which they yield. Assuming that ten different amino-acid derivatives are united even without duplication to form a single protein, mathematical calculation indicates the possibility of over three million different combinations; for eighteen amino-acids the possible combinations have been estimated to exceed millions of millions. In the face of such figures one realizes what specificity may really mean when thousands of structurally isomeric compounds can theoretically, at least, yield precisely the same proportions of the same amino-acids and yet remain distinct in respect to the relative arrangement of their constituent units. The development of an almost innumerable number of special enzymes, as suggested by Abderhalden's recent studies now widely applied in serodiagnosis, likewise finds the possibility of an explanation in what has just been noted. A thousand structures may require a thousand different keys to unlock them.

It might be illuminating to dwell further on other consequences entailed by the development of the biochemistry of the amino-acids; but we must return again to the physiology of two decades ago for a reminder of other changes that have been wrought by the hands of progress. Urea was, of course, recognized as the predominant excretory end-product of nitrogenous metabolism. Its history was difficult to follow, and almost entirely obscured. Foster voiced a then current belief in his widely studied text-book in suggesting that a large portion of the urea leaving the body by the urine is formed from the creatin of the muscle, though the objections to such a theory were already obvious to him. The normal presence of creatinin in the urine offered a difficulty which was not entirely solved by charging its origin to creatin ingested as meat. Nor was only creatinin left as a source of confusion. Uric acid and other excreted products remained to be accounted for, as they occurred in varying amounts in the urine.

Foster wrote:

Urea is the chief end-product of proteid metabolism, but that end is probably reached in several ways; so that probably a very large number of nitrogenous chemical substances make a momentary appearance in the body. Some of these fail to become urea, and either without or after further change make their appearance in the urine. But we do not know whether their appearance is accidental, the result of imperfect chemical machinery; or whether they, though small in quantity, serve some special ends in the economy. Perhaps sometimes, or with some of them it is the one case, at other times or with others it is the other case. . . . The evidence as far as it goes tends to show that the metabolism of proteid is very complex and varied, that a large number of nitrogen-holding substances make a momentary appearance in the body, taking origin at this or that step in the downward stairs of catabolic metabolism and changing into something else at the next step, and that the presence in various parts of the body and even in the urine, in small quantities, of so many varied nitrogenous crystalline substances, forming a large part of what are known as extractives, has to do with this varied metabolism. Possibly the transformations by which nitrogen thus passes downward take place to a certain extent in such organs as the liver and the spleen, which are remarkably rich in these extractives. But the whole story of proteid metabolism consists at present mostly of guesses and of gaps.

In this veil of mystery that surrounds the chemical transformations of the food-substances in the body there are today many rifts through which new truths have been brought to light. Uric acid is no longer associated with the metabolism of the simple proteins, but is recognized as the excretory end-product of the purins, a group of compounds distributed widely in nature, either free or combined as they are in the nucleoproteins of cellular tissues. By the exclusion of glandular material, like liver and sweetbreads, and of meat with its free hypoxanthin, the dietitian can reduce the production and output of uric acid in man at will. Here is one of the striking instances of where, through the newer knowledge of foods and metabolism, the physician has become a master of the chemical performances of the organism. The creatinin of the urine, provided that it is not reinforced by ingested precursors in meat, represents a story of the inner workings of the organism quite independent of the protein in the diet. The ammonia output is in a measure an index of the overproduction of acids in the body. Although by no means the only regulatory device whereby the neutrality of the blood and tissues is maintained in health, ammonia is nevertheless automatically furnished in conspicuous amounts when it becomes necessary to offset an impending acidosis. Hitherto the therapeutic procedure in such cases has been to furnish an alkali, commonly sodium bicarbonate, and thereby conserve the available supply of bases in the body from depletion. Recent studies have shown that a similar contribution of bases is afforded by a judicious selection of the dietary. There are foods which act as potential acids and others which function as bases in the organism. When burned up either in the laboratory or in the body-cells, they leave a preponderance of acid or base, as the case may be, in their ash. In this respect potatoes, apples, raisins, and cantaloupe, for example, are base-forming foods which depress the output of ammonia and increase the solubility of uric acid in the urine, as the experiments of Dr. Blatherwick in our laboratory have demonstrated; whereas meats, cereals and prunes (the latter with their content of benzoic acid) furnish acids in preponderance. Milk is intermediate in this respect. From the point of view here raised it is quite easy to accomplish as much with a liberal allowance of certain selected foods as with half an ounce of the familiar bicarbonate. To do this, however, implies that the physician must become as well acquainted with the properties of the foods as he appears to be with such novelties as amboceptors and complement, polyvalent vaccines and immune serums, salvarsan and epinephrin.

Turning attention to another group, the fats, the question must have arisen in the minds of many a physician as to why certain representatives of these foodstuffs have so long maintained a reputation for superior merit in connection with nutrition. There are several fluid fats which are quite as available, or even more easily procurable than is cod-liver oil. Yet this product continues to enjoy a vogue that cannot be dismissed as the mere result of advertising propaganda. Cod-liver oil was a favorite, particularly in the dietotherapy of children, long before the present era of catch-phrase circulars and illuminated billboards. Its supposed unique virtues have called forth varied attempts at explanation. At one time it was the trace of iodine found in cod-liver oil which was

believed to endow it with superiority over other fats like cottonseed oil and olive-oil having essentially the same physical properties and the same mixtures of glycerids, or fats proper. When this explanation no longer appeared tenable, the superior value of cod-liver oil was attributed to its ready digestibility. Lately Osborne and I have observed an unexpected efficiency in the product which is not shared by many other fats of similar superficial properties. We have fed growing animals (albino rats) on mixtures of isolated food substances including an abundance of fat in the form of commercial lard until, owing to the lack of some essential and as yet unknown ingredient of adequate dietaries, growth was checked. The replacement of a portion of the lard in the diet by cod-liver oil invariably brings prompt restoration of growth which continues uninterrupted until the adult stage is reached. Butter-fat and egg-yolk fat likewise contain a "growth-promoting" ingredient which appears to be more or less completely wanting in other dietary fats of both animal and vegetable origin. There is, for example, a marked difference between lard and the fat elaborated by the mammary gland. Whereas our experimental animals show symptoms of malnutrition with a cessation of growth and decline in weight at the end of three months on a diet including lard as the sole fatty ingredient, when either butter-fat or cod-liver oil were used there was no sign whatever of failure after a year or more of uninterrupted feeding on the same diet day after day.

It is well known that all of the naturally occurring fats, such as have just been mentioned, are complex mixtures of true fats in the chemical sense, along with other substances including lipoids, pigments and compounds more soluble in fat than in the watery mediums of the body. The lipoids, in particular—cholesterol, lecithins, cephalins—have come into prominence in connection with various reactions involved in serum diagnosis and such phenomena as hemolysis, narcosis and absorption. Though long recognized as a constituent of the nervous tissues and certain pathologic products such as gall-stones, cholesterol has remained a compound of unknown function until very recent times. At the present moment the consensus of opinion appears to be that cholesterol is not ordinarily formed within the organism of the higher animals, and that these are dependent on the food intake to maintain the essential supply thereof. If this be true the ultimate source must reside in constructive plants; and assuming occasional losses from the body, doubtless with the feces, the store of cholesterol can be kept intact in man only by renewal from a suitable dietary. Ordinarily, in the adult living on a ration of products derived from many sources, no difficulty arises, because compounds of the cholesterol type are widely distributed and presumably found in all cells; but it is quite conceivable that in individuals like growing children or patients living on a diet restricted in character a real deficiency of cholesterol may ensue. It is known that the hemolytic phenomena of the red blood-cells are related to their lipid content; and the therapy of the future may find a place for such substances as cholesterol, cephalin, etc., in the management of hemolytic anemias and other pathologic manifestations. Here, again, the intricacies of the diet cannot be overlooked by the intelligent physician of the future.

I have dwelt somewhat on the possibilities in respect to cholesterol and the growth-promoting components

of milk-fat, egg-fat and cod-liver fat because it affords an opportunity to emphasize the hitherto largely unappreciated importance of factors in nutrition which cannot be expressed in terms of the familiar protein, fat and carbohydrate or in calories of energy. These factors may be inorganic in some cases, as is instanced by the reputed rôle of iodine and the wide distribution and alleged significance of manganese, boron, silicon and other elements in animal tissues; they are frequently organic in character. To class these varied factors together under the euphonious designation of "vitamins," as has lately been done, does not render less obscure the deficiencies which the absence of them from the diet may entail; nor does it give any clue to the mechanism whereby growth may be promoted, metabolism stimulated, or deficiency diseases engendered. Not only in those admitted instances of diet deficiencies such as beriberi and scorbutus, but also in numerous other clinical and experimental types of malnutrition there is need for further research. The proverbial adherence of the medical profession to dogmatic statement must be changed. Its members must become eager to take up the current views, study the underlying data as well as they can, and watch the consequences. Let us welcome the day when the food market and the kitchen are taken into consideration by the physician as seriously as are the apothecary's shop and the fashionable spas.

If in all the foregoing little mention has been made of the carbohydrates in nutrition, it has been because, in a general way, more has been known about them for a longer time than is true of the other nutrients. Even among the carbohydrates the principle of specificity comes into play. The physiologic carbohydrates are the six-carbon sugars, such as glucose, levulose and galactose. Unless an ingested carbohydrate can be converted into this simple type of sugar in the alimentary tract, its nutritive value is distinctly impaired or entirely lost. For this reason, all attempts to introduce more complex sugars, dextrins or starches directly into the blood-stream, for prompt distribution to the tissues which need them, have failed. In experiments conducted in our laboratory, animals have received subcutaneous or intraperitoneal injections of cane-sugar or milk-sugar for weeks and months without acquiring the capacity to utilize so little as a single gram introduced in this way in an undigested form. Carbohydrates like inulin and the galactan of agar-agar or of Irish moss can furnish no energy to the human organism because it is unable to digest them, that is, to convert them into simple sugars. The possibility of nourishing an individual in some way other than by the oral path evidently depends on introducing the nutrients in the form of those units—the amino-acids, simple sugars and fats—which normally constitute the actual pabulum of the hungry cells.

Physiology has borrowed its methods largely from the sciences of physics and chemistry. It also has a fruitful method of its own, that of experiments on animals and man. None of these procedures can be dispensed with. They corroborate and supplement each other, and they serve to test the hypotheses which give the impetus to progress. The medical profession must insist on conserving for the physiologic sciences the opportunity to continue its studies untrammelled by the passing prejudices of those who fail to appreciate its motives.

18 Trumbull Street.

INTERMEDIARY PROTEIN METABOLISM*

OTTO FOLIN, PH.D.

BOSTON

The subdivision of protein metabolism into intermediary metabolism and tissue metabolism indicates that we to-day are in possession of a much more detailed and accurate knowledge concerning animal metabolism than was available a few years ago. The controversy between Voit and Pflüger and their followers of the past generation as to whether the protein of the food must be incorporated in the protoplasm of the tissues before it is oxidized was an unprofitable and useless controversy, because it was too far in advance of the experimental knowledge of that period. We still do not know the spatial relationship between protoplasm and food materials at the moment of oxidation. On the other hand, we no longer speak of protein metabolism as being an oxidation process at all in the sense understood by Pflüger and Voit. While protein materials like other carbonaceous food materials are of course finally oxidized in the body, we now believe that the nitrogenous foodstuffs first undergo changes and chemical transformations involving the loss of all protein characteristics before they are completely destroyed by the oxidation processes involved in the production of heat and energy. Through the investigations of Kutscher (1898), and more recently of Abderhalden and his associates, it has been made clear that protein materials are completely decomposed into simple crystallizable products, the amino-acids, as a result of digestion. This discovery is fundamentally important for it has necessitated a complete revision of the earlier ideas and doctrines as to the nature of the metabolic processes involved in the utilization of protein as food. The old, burning question as to whether protein must be incorporated in the living tissue protoplasm before it is oxidized we now know was a false question, because the food protein has been altered beyond recognition even before it leaves the digestive tract and many of us no longer believe that protein as such is ever oxidized in the body.

The discovery that protein materials are split up into the simplest possible component parts during the digestion suggested two new fields for metabolism investigations. The first of these is the question as to whether simple amino-acids can be substituted for ordinary food protein, and which if any of the amino-acids are most indispensable for the maintenance of the animal organism. Much interest and important work has been done in this field, and it has become quite clear that some amino-acids are indispensable while others appear to be less necessary constituents of the food. The importance of all these data to the science of metabolism, if not to medicine, is self-evident in view of the fact that practically all the amino-acids can be manufactured. The second metabolism problem which required renewed investigations when the deep-seated character of protein digestion became clear concerns the subsequent history of the digestion products, and inasmuch as my own investigations lie in this field, I shall confine myself to a discussion of this problem.

Formerly it was generally believed that protein materials were but little altered by the digestion, and the protein of the food was supposed to pass into the blood-stream without any material alteration. Since no peptones were found in the blood the peptones formed during the digestion were supposed to be regenerated into more complex albuminous materials while passing through the mucous membrane of the intestinal wall just as fatty acids and glycerin are believed to be transformed into neutral fats during the absorption. This hypothesis seemed plausible, because it agreed with the experimental observations and because the animal organism was supposed to be dependent on the complex kind of proteins found in the blood. Many investigators, including Kutscher and Abderhalden, adhered to this explanation of what happens to the nitrogenous food in the intestinal wall even after it became certain that amino-acids and not peptones were the chief end-products of the digestion. Many physiologists, however, abandoned the protein regeneration hypothesis about ten years ago. To them it seemed highly improbable that the proteins should first be completely split up into amino-acids only to be immediately recombined into albumin and then again immediately broken down so as to give the urea, the elimination of which is greatly increased three or four hours after the intake of protein food.

In place of the protein regeneration hypothesis these dissenting physiologists assumed that the transformations of nitrogenous materials which take place in the intestinal wall are of a destructive rather than of a constructive character. Just as the digestive ferments convert the proteins into amino-acids within the digestive tract, so by a continuation of the digestive or hydrolytic processes most of the amino-acids immediately lose their nitrogen while passing through the intestinal wall and the liver. The prompt formation of urea, the supposedly large amount of ammonia in the portal blood, and many other features of the nitrogen metabolism were explained in a fairly plausible fashion by this hypothesis.

There remained, however, another possibility, namely, that the intestinal wall does nothing to the amino-acids but simply lets them through. From a theoretical aspect, this point of view has been the most plausible, and notwithstanding numerous early failures, the efforts to prove that the amino-acids are absorbed from the intestine without change have been continued, and now there is no longer any doubt about the fact that the end-products of protein digestion, the amino-acids, are quickly and easily absorbed. In fact, the speed of the absorption and the speed with which the amino-acids are distributed to all the different tissues in the body is one of the reasons why the earlier investigators failed to find the digestion products in the blood.

By means of the quantitative colorimetric methods devised in my laboratory, by means of Van Slyke's micro method, and by means of Abderhalden's qualitative ninhydrin test it is now easy to show that the amino-acids are absorbed. We have therefore now not the slightest reason for believing that the amino-acids formed during the digestion undergo any change while passing through the walls of the intestine.

The essentials of the story of protein digestion and absorption appear to be very clear indeed, and can be stated in two or three sentences. In the stomach the greater part of the protein is dissolved and much of it is converted into albumoses and peptones. In the

* Read before the joint meeting of the Section on Practice of Medicine and the Section on Pathology and Physiology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, June, 1914.

accurate method of indirect calorimetry. The box is ventilated by a rotary fan which sucks the air out of one end of the chamber, drives it through a bottle of sulphuric acid to remove all moisture, then through a bottle of soda lime to remove the carbon dioxide and finally returns the same air, absolutely pure and odorless, to the other end of the calorimeter. As the patient uses up oxygen, this gas is supplied automatically from a small tank. By weighing these various bottles and tanks at the beginning and end of each hour it is a simple matter to determine the carbon dioxide produced and the oxygen consumed. Knowing the relative proportions of these and also the nitrogen of the urine one is able to calculate with great accuracy the grams of protein, fat and carbohydrate oxidized by the patient during that hour. Knowing the heat produced by the oxidation of 1 gm. of each of these substances it becomes a simple matter to calculate the total heat production.

The two methods of direct and indirect calorimetry agree within 5 per cent. in about three-fourths of the experiments, and in many cases the figures are almost identical as is shown in Chart 1, that of one of the

hours after the last meal. It will be seen in Chart 2 that if we express the metabolism in terms of calories per square meters of the body surface per hour, the results will group themselves close to the average figure of 34.2 irrespective of the body-weight. The dotted line represents the average of forty-nine normal controls studied by various types of apparatus in many laboratories. It is evident that the level is the same for persons whose weights are between 40 and 50 kg. (from 88 to 110 pounds) as for those whose weights are between 60 and 70 kg. (from 132 to 154 pounds). On the other hand, if we express the results in terms of calories per kilogram per day we have a line of averages which falls steadily as the weight increases. In order to have a single base-line which need not be changed for persons of varying weights we therefore compare all our results with the average normal figure of 34.2 calories per square meter per hour.

While the metabolism of a given individual remains fairly constant for years, there may be a variation among normal men of 10 per cent. above or 10 per cent. below the average. Further study will perhaps show even a greater variation. The metabolism is

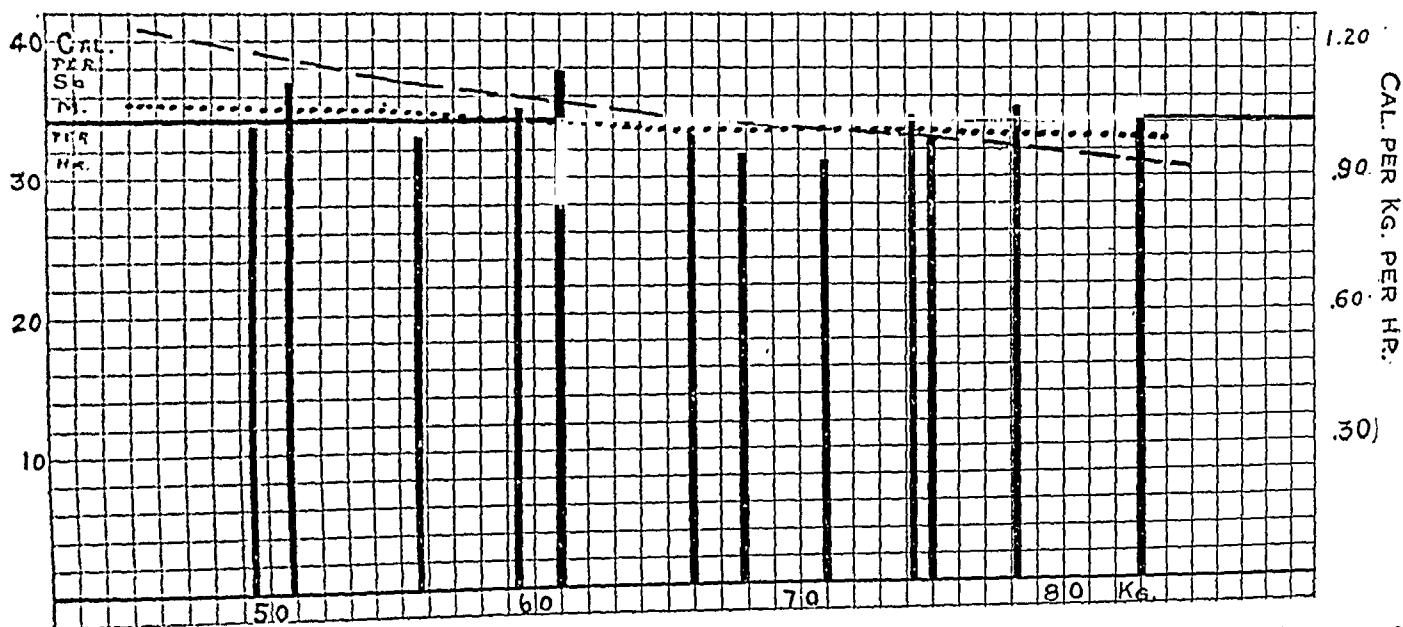


Chart 2.—Basal metabolism of normal men from fourteen to sixteen hours after the last meal. Columns represent calories per square meter per hour produced by subjects in bed calorimeter. Horizontal line drawn at 34.2, the average. Interrupted lines represent averages of 49 normal controls studied with various types of respiration apparatus, arranged in five groups according to weight. Dotted line shows the results expressed according to surface area. Dash line represents the same 49 controls with the results expressed in terms of calories per kilogram per day.

normal controls. In the total of all the experiments so far calculated, involving the measurement of 23,000 calories, the two methods agree within 1.6 per cent. As yet no disease has been found in our somewhat limited series of observations in which there is any consistent disagreement between the two methods. This is a matter of considerable import, since the previous work in the study of the heat production in disease has been done almost exclusively by the method of indirect calorimetry. The agreement of the two methods shows that the calculations by indirect calorimetry have not been vitiated by any profound and unsuspected changes in the intermediary metabolism.

It is comparatively easy to determine the total metabolism but difficult to find the exact normal figure with which to compare the results. We have measured the basal heat-production of a number of normal persons of varying weights and have grouped them with the normal controls examined by Benedict in his bed calorimeter, all determinations being made on individuals at complete rest, from fourteen to sixteen

increased in childhood, diminished in old age, and probably depends, to a great extent, on the nutrition of the body and the mass of active protoplasm. Nevertheless, Rubner's law that the metabolism of different individuals and different species of animals is proportional to surface area does hold good within certain limits. These limits may be wide when we try to compare the metabolism of babies, guinea-pigs, athletes and fat men, but, as we have shown above, the limits are narrow for a group of men of approximately normal build.

Voit and Rubner demonstrated the fact that the taking of food raised the heat production, and the term of specific dynamic action was applied to this phenomenon. The cause of this was little understood until Lusk² studied the matter in great detail, making hourly determination of the heat production of dogs in the small Cornell calorimeter. His work on dogs

2. Lusk: Animal Calorimetry. Papers II, III, V, VI, Jour. Biol. Chem., 1912, xii, 349; xiii, 27, 155, 185; Cause of the Specific Dynamic Action of Protein, Arch. Int. Med., December, 1913, p. 485; The Specific Dynamic Action of the Foodstuffs, this issue, p. 824.

has been duplicated on normal men as nearly as the human stomach will permit, but, of necessity, the amounts of food are relatively smaller and the increases in heat production distinctly less marked. Chart 1 shows the basal metabolism of control D and the effects of glucose and protein meals. The increase after glucose amounts to from 8 to 10 per cent. and after protein to 12 per cent.

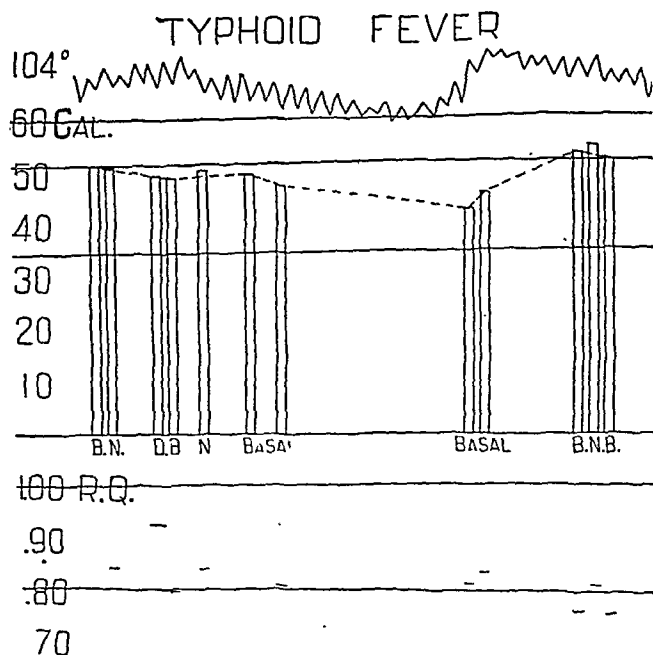


Chart 3.—Typhoid fever, "Morris S." Basal determinations, B connected by dash line. N, protein meal. D, from 100 to 200 gm. of glucose. Results expressed in averages.

Since the time of Voit and Pettenkofer a great deal of work has been done on the subject of the respiratory metabolism and total heat production in disease. Magnus-Levy³ established the fact that in exophthalmic goiter the energy requirement was greatly increased even to a point as high as from 50 to 70 per cent. above the normal and showed that in cretinism and myxedema the heat production might be as low as from 45 to 50 per cent. below the normal. Kraus,⁴ Grafe,⁵ Rolly⁶ and others demonstrated that in typhoid fever the metabolism was raised to from 30 to 40 per cent. above the normal. Grafe⁷ has recently shown that the heat production is low in certain stuporous conditions and increased in lymphatic leukemia and cancer. The total heat production in diabetes has been studied by many observers with varying results, but Benedict and Joslin,⁸ using the calorimeters in Boston, have shown that in cases of severe diabetes with acidosis there is an increase in metabolism.

The study of the metabolism in typhoid fever and the effects of the high-calory diet was begun in Belle-

vue Hospital in 1911 in association with Dr. Warren Coleman. The small Benedict apparatus was used and the calculations were made according to the method of indirect calorimetry. A summary of the results will be presented by Dr. Coleman⁹ in another Section but it may be stated that the heat production of the patients was not raised by the administration of large amounts of food during the height of the fever. The matter seemed so important that it demanded investigation by the use of the calorimeter.

Observations were therefore made on nine typhoid patients during the course of the fever and convalescence. The first part of the results on one patient, who was in the calorimeter twenty-two times, is shown in Chart 3. This patient enjoyed the work with the calorimeter. His original infection was by no means mild and he had one relapse which was severe and a second relapse which scarcely interrupted a rapid convalescence. Throughout the disease he was so well nourished that his weight remained practically constant.

It will be noticed that during the fever his total metabolism was from 40 to 50 per cent. above the average normal and that it was scarcely increased at all on the days when the observations were made shortly after the ingestion of 100 gm. of glucose or 64 gm. of protein. A study of the nitrogen in the urine in this and three other cases shows that the percentage of calories derived from protein during fever when the patients were fasting was seldom raised above the upper normal limit of 20 per cent., although one patient early in his disease derived 28 per cent. of the calories from protein.

As the temperature falls the total metabolism diminishes and the percentage of calories derived from protein drops to 10 or 15 per cent. During convalescence heat production may be from 20 to 30 per cent. above normal, and at this stage glucose and protein exert as great a specific dynamic action as in health.

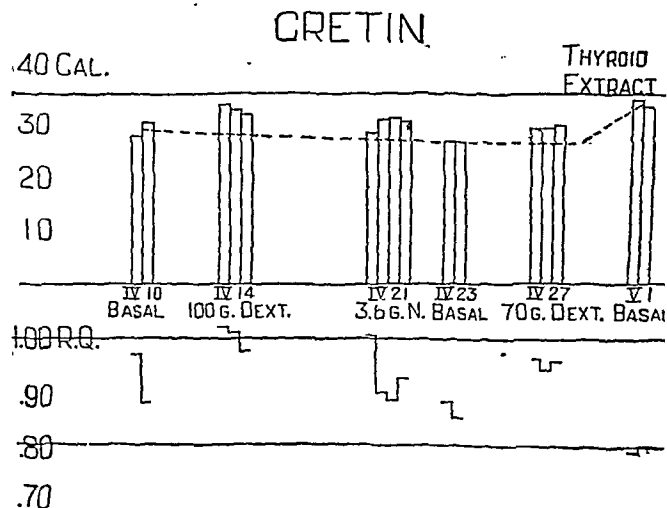


Chart 4.—Cretinism results expressed in hourly periods. Thyroid-extract treatment begun two days before last observation.

The diseases of the thyroid gland have been studied with particular interest since the level of the total metabolism seems to be the best index of the activity of the thyroid secretion. In one cretin who was 36 years old but had the mental and physical development of a child of 8, the total energy requirement was from

3. Magnus-Levy: Gaswechsel bei Thyroiden, Berl. klin. Wchnschr., 1895, xxxii, 650; Ueber Myxödem, Ztschr. f. klin. Med., 1904, lii, 201.

4. Kraus, Fr.: Ueber den respiratorischen Gasaustausch im Fieber, Ztschr. f. klin. Med., 1890, xvi, 160.

5. Grafe: Untersuchungen über den Stoff- und Kraftwechsel im Fieber, Deutsch. Arch. f. klin. Med., 1911, ci, 209.

6. Rolly: Experimentelle Untersuchungen über den Stoffwechsel im Fieber und in der Rekonvaleszenz, Deutsch. Arch. f. klin. Med., 1911, cii, 93.

7. Grafe: Beiträge zur Kenntniss der Stoffwechselverlangsamung bei stuporösen Zuständen, Deutsch. Arch. f. klin. Med., 1911, cii, 15; Die Steigerung des Stoffwechsels bei chronische Leukämie und ihre Ursachen, Deutsch. Arch. f. klin. Med., 1911, cii, 406; Das Verhalten von Gesamtstoffwechsel und Eiweissumsatz bei Karzinomatosen, Deutsch. med. Wchnschr., 1914, xl, 518.

8. Benedict and Joslin: Metabolism in Diabetes Mellitus, Carnegie Inst. Wash., 1910, Pub. 136; A Study of Metabolism in Severe Diabetes, 1912, ibid, Pub. No. 176.

9. Coleman, W.: The Effects of Food on Metabolism in Typhoid Fever, read in the Section on Pharmacology and Therapeutics at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

18 to 25 per cent. above the normal but was raised almost to the normal on the third day of treatment with thyroid extract (Chart 4). The specific dynamic action of food was normal in this patient.

A series of seven patients with exophthalmic goiter were studied before and after treatment in an effort to guide the therapeutics in this disease, which is remarkable for the number of "remedies" that do not give relief. Luckily we were able to show some beneficial effects of treatment, although good results were obtained by rest and careful feeding alone. One patient, who had shown moderately severe symptoms for one year, was studied over a considerable period of time. If we look at the results as expressed in Chart 5, we notice that, in marked contrast to the cretin, the metabolism is 80 per cent. above the normal, falling to 60 per cent. on rest and good food. Von Noorden¹⁰ has stated that the specific dynamic action of food and especially of meat is increased in fever and in exophthalmic goiter. We have seen that this was not the case in fever and it was evidently not true

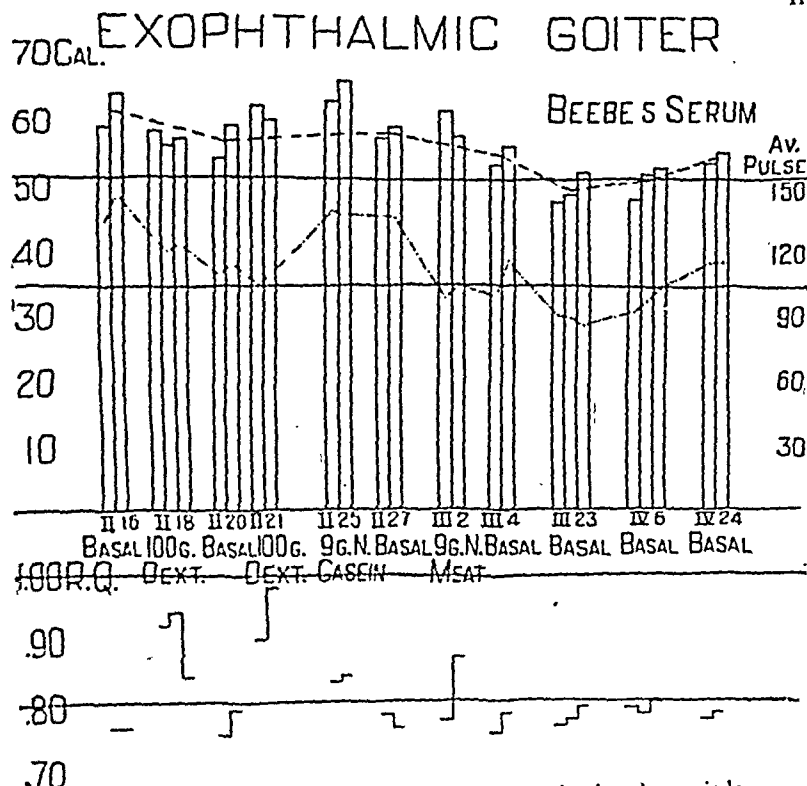


Chart 5.—Exophthalmic goiter. Results shown in hourly periods. Dash line connects basal determinations. Dot-dash line represents average pulse during the period of observation in calorimeter.

of this patient, since his metabolism was not raised even so much as that of a normal man by glucose, casein and meat. After treatment by Dr. S. P. Beebe with his antithyroid serum, there was a distinct improvement in the man's condition and fall in the metabolism. After the first month there was a rise in metabolism to its former level but the general improvement continued perhaps, however, at a slower rate.

A young woman who was up and about, though not quite able to continue her work as trained nurse, showed the extraordinarily high metabolism of 92 per cent. above the normal. After ligation of the arteries by Dr. John Rogers, the metabolism fell to 60 per cent. above the normal and the patient's condition was distinctly improved.

One young woman with a mild case of the disease showed a marked rise in metabolism four days after

ligation of the four thyroid arteries, indicating that the operative procedure had temporarily increased the activity of the gland. Later there was distinct improvement in her general condition and a fall in the heat production to its former level.

Other conditions have been studied in a few cases and while the results need confirmation, they are suggestive and may lead to a better understanding of the various factors which influence the heat production in disease. One patient with splenic anemia, whose hemoglobin was 25 per cent., had a metabolism 11 per cent. above the normal; another with pernicious anemia for which a splenectomy had been performed, showed an increased metabolism amounting to 20 and 26 per cent. above the normal, while his hemoglobin was only 20 per cent. This confirms the older work, which demonstrated that there is no diminution of oxidation as a result of the low percentage of hemoglobin. In a patient with nephritis a change in blood-pressure from 195 to 160 caused absolutely no change in heat production. One man with acromegaly had a metabolism 18 per cent. above the normal, another with

symptoms of deficiency of the secretion of the posterior lobe of the hypophysis gave results sometimes high and sometimes normal but he was so stupid that he made a very unsatisfactory subject. Another man with malaria was studied at the height of his fever, and also six days later when his attacks were cured. With a temperature of 104 F. the metabolism was 83 per cent. above the average, with a normal temperature 21 per cent. A patient with auricular fibrillation, mitral stenosis and greatly enlarged heart but without orthopnea, was observed three times lying flat on his back and twice propped up with a back-rest. We were astonished to find the metabolism which was normal when he was propped up was 8.5 per cent. higher when he was lying down and were even more surprised to observe the same phenomenon in the only normal control we studied in this posture.

The increases due to fever, hyperthyroidism and the like, are probably small compared to the increase caused by muscular work in delirium tremens or convulsions. Even slight restlessness or mild excitement causes a rise in heat production which is distinctly appreciable in the calorimeter.

In conclusion, it may be well to emphasize the fact that the nutrition of a patient depends absolutely on the relationship between his energy production and his food-supply. If the organism fails to obtain food from without it will draw on its own glycogen stores, fat depots and supplies of body protein.

129 East Seventy-Sixth Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF MENDEL, FOLIN, LUSK AND DU BOIS

DR. S. J. MELTZER, New York: For more than thirty years I have been moving on the periphery of laboratory work on one side and clinical medicine on the other side. Well do I remember the wide gulf which separated the laboratory men from the men in clinical medicine. To-day we have heard four men telling of their work in the sciences of medicine and telling it to a large audience, consisting, as far as I can judge, chiefly of men who are active in the practice of medicine. There are reasons for more congratulations. We heard to-day four men telling of their own original work in the scientific part of medicine. In the times gone by the laboratory man was satisfied to discuss work which was done on the other

10. Von Noorden: New Aspects of Diabetes, New York, E. B. Treat & Co., 1912, p. 20.

side of the Atlantic; to-day the scientific men in Europe take profound notice of the work done in this country. Again, in the past, laboratory men used to be proud of the fact that they had nothing to do with the practice of medicine. To-day the laboratory men are anxious to do work in fields which are of special interest to the practitioner. Mendel speaks of "gaps and guesses" in scientific reports. I am certain that a thousand years from now "gaps and guesses" will have a prominent place in scientific reports. The gaps which we fill out by our investigations, we do by means of guesses, and they reveal to us new gaps. Liebig's theories are mere guesses for us to-day, to be forgotten. But they were instrumental in filling up many gaps by facts. Theories are of value because they help us to discover facts, and as long as they can do that they are still of value to us. I wish to say to Dr. Mendel that the amboceptor theory of Ehrlich, of which he spoke somewhat disparagingly, has brought out thousands of important facts in immunity, and is still capable of bringing out new facts. I am still more sorry that Dr. Mendel spoke in a somewhat disparaging manner about salvarsan. The synthetic creation of such a specific substance like salvarsan is one of the most wonderful discoveries made in recent times in the sciences and practice of medicine. The discovery by Dr. Mendel in conjunction with Osborne, that butter does contribute to the growth of rats, while lard does not do it, is perhaps the best he has ever made. This discovery was made by the empirical method; they do not tell us on what hypothesis they found it; neither what is the nature of the "vitamin" which differentiates lard from butter. We call this method, when used in science, the inductive method. But it differs from the empirical method which the physician uses merely by the application of criticism. Criticism is here necessary to differentiate the coincidental from the causal connection. Here the physician must learn from the scientist. A patient may get better merely while he is taking a drug and not because he takes it. But there is one point which the scientist has to learn from the physician; it is the principle of *non nocere*: be sure that you do not do any harm. For instance, the knowledge that the minimum diet is of no perceptible immediate harm to animals is no evidence that it will be of no harm, acute or chronic, to human beings. Neither do we know that infants will behave like rats regarding the difference between butter and lard.

DR. F. M. POTTENGER, Los Angeles, Cal.: Does this difference in the absorption of fats apply to all animals alike, whether herbivorous or carnivorous and also to man?

DR. E. P. JOSLIN, Boston, Mass.: I should like to ask Dr. Lusk if he has an explanation to offer as to why the metabolism is not increased by food in typhoid fever?

DR. ALLAN EUSTIS, New Orleans: I wish to discuss that part of the paper in which Dr. Mendel refers to the amins formed by the putrefaction of the several amino-acids in the intestinal tract. This has a broad practical application in clinical medicine, as each of these amins has its own specific physiologic action, just as the amins from the vegetable kingdom, represented by the alkaloids strychnin, morphin, etc. Tyramin (para-oxyphenylethylamin), which is yielded by tyrosin on putrefaction, is capable of raising the blood-pressure in a dog from 110 to 250 mm., while in man it has produced a rise to 180 mm. I have made application of this fact in treating nearly five hundred cases of arterial hypertension, in which the systolic blood-pressure has been kept down to 140 or 150 mm. by dietetic means alone. It must be remembered that caseinogen of milk yields 7 per cent. of tyrosin on digestion which contra-indicates milk as an ideal food in this condition. Inasmuch as all animal proteins yield large amounts of tyrosin they are also contra-indicated, while the best results will be obtained from a cereal and fruit diet. The clinical application of the formation of histamin (beta-imidazolylethylamin) from histidin can be made in the treatment of bronchial asthma and urticaria. When injected intravenously, this amin causes violent bronchial spasm similar to an attack of asthma, while when rubbed vigorously into the skin a solution of 1:1,000 causes a typical urticarial lesion. Along dietetic lines alone, I have been able to give relief in 168 cases of bronchial asthma and twenty-six cases of urti-

caria, some of the asthmatics having had the disease for twenty years. A diet for these conditions should be based on the fact that the yield of histidin in the more common types of proteins is: hemoglobin, 10 per cent.; sturin, 12 per cent.; caseinogen, 2.5 per cent.; 2.5 per cent., and gliadin, 1.4 per cent. Articles of diet which yield little or no histidin may be allowed. It must not be concluded that all cases of arterial hypertension are due to the absorption of tyramin from the intestinal canal, nor that all cases of asthma and urticaria are due to histamin absorption; but it must be admitted that these amins have a decided practical bearing in clinical medicine and must be reckoned with.

DR. DOUGLAS HEAD, Minneapolis: I should like to ask whether any observations have been made as to the effect of butter feeding on heat production in long, thin-chested, enteroptotic persons as compared with those of short, stocky build?

DR. A. J. CARLSON, Chicago: I think you all know that in this particular field America has made a distinct contribution to science. I have been impressed by the interest taken in this symposium by the members of the American Medical Association. If there is anything new of importance in the practice of medicine it is this modern work in nutrition. And it is evident that when the laboratory men really have something to say the clinical men will listen.

DR. VICTOR C. VAUGHAN, Ann Arbor, Mich.: Will Dr. Folin explain one point on which he did not touch? We recognize that in enterodigestion the proteins are split into amino acids. Dr. Folin holds that the amino acids are absorbed directly into the walls of the intestines, a view held by many others. The proteins are carried to each cell and each cell utilizes what is suited to its needs. This I dare say is all right. One point which he should explain, is important. There must be some synthesis of amino acids in the body. The sero-albumin and globulin in the blood are specific proteins, each coming from different sources. These are taken into the blood, and by the brilliant work of Folin and others we are now able to demonstrate the presence of amino acids in the body. Now there must be some synthesis somewhere. We must not lose sight of the fact that enterodigestion is not the only form of digestion that occurs in the animal body. There is in the blood a digestive process as much as in the intestines. A proteolytic ferment is present in the blood, a trypsin and an antitrypsin, and the understanding and the adjustment of the relation of these two factors is one of the great problems of physiologic chemistry.

DR. OTTO FOLIN, Boston, Mass.: Undoubtedly all will agree that the question asked by Dr. Vaughan is too much for even a laboratory worker to attempt to answer. The question that Dr. Vaughan has really asked is "How are tissues formed?" I have discussed the subject of the destruction and the history of protein in the body from the point of view of food and from that of destructive metabolism. The matter has two aspects, a destructive and a constructive; the constructive or the synthesis of protein is synonymous with the formation of tissue itself and is far from the transformation of amino acids into urea. There are two distinct aspects of metabolism. I considered only the destructive processes, the breaking down, and these only as produced by the class of agents sometimes known as enzymes. Frequently enzymes are of the destructive variety. They are hydrolytic and there is a degradation form of reaction. As to the difference between the enzymes and the proteins and the subject of hydrolytic and synthetic ones, all can discuss this part of the subject as well as I can.

DR. GRAHAM LUSK, New York: Replying to Dr. Joslin's question, "Why is there no increased metabolism in typhoid fever after giving an excess of food?" I would call attention to the fact that under normal conditions the basal metabolism is measured by the heat production of a subject whose gastro-intestinal tract is free from food and who is living at an environmental temperature of 26 C. (78.8 F.). If, however, the temperature be lowered there is an increase in the heat production although, under these circumstances, the ingestion of food may now produce no specific dynamic action. Furthermore, it is known that, if the metabolism be

increased to a certain point through carbohydrate, the addition of amino acids to the diet may cause no further increase in metabolism. Likewise, it should be remembered that in fever the protein metabolism can never be reduced to the low level present in the normal person, so that when amino-acids enter the organism under these circumstances they tend merely to replace those already breaking down in large quantity. It is therefore apparent why in fever the metabolism may have already been lifted to such a level that ingestion of food causes no further increase.

DR. EUGENE F. DU BOIS, New York: A comparison of the metabolism of enteroptotic persons with that of short, stocky men would be interesting, but we have had no opportunity of making such observations. From a theoretical consideration it would seem that the enteroptotic, undernourished persons would have a rather low metabolism, and it would seem that muscular persons would have the higher metabolism. Yet from clinical observations it appears that the enteroptotic persons have the greater energy requirement. We have at times tried to guess the actual heat production of individuals and groups of patients but have found that sometimes we were as much as 25 per cent. from the true figures as determined by the calorimeter.

COMMON ERRORS IN GALL-TRACT SURGERY*

C. E. RUTH, M.D.
DES MOINES, IOWA

An operative technic which gives a low mortality may be far from perfection, especially when relief is not obtained by the patient from the trouble for which the operation was done, or when other calamities must be endured by the patient which are a direct result of the operation.

In no class of operative procedures for non-malignant conditions are secondary operations required in so large a percentage as in those done on the gall-tracts. In no class of abdominal work is the temptation greater for inefficient or incomplete work, and in none is complete work more difficult than that encountered in many of these cases. Stones in the common duct, at or near the lower end, are found and removed successfully by only a very few operators. The amateur aspirant to surgical honors and perquisites can safely drain a large readily accessible gall-bladder, and if perchance he find a stone, that is the end of the matter with him as covering all requirements and obligations.

I am reminded that once I opened the abdomen, after having done several thousand abdominal sections, and examined carefully for gall-stones and did not find any, but at post-mortem four weeks later seventeen stones were found in the gall-bladder and one in the ampulla of Vater.

At another time when doing an abdominal section for other causes I confirmed by direct palpation a previously made diagnosis of gall-stones, but six months later when the patient came to operation for removal of the gall-stones, I could not even find a gall-bladder, but encountered pancreatic calculi amounting to over a thousand grains, forming a complete cast of the entire pancreatic duct system. These I was able, with great difficulty, to remove successfully through incisions in the pancreas after opening through the gastro-

hepatic fold of mesentery, which enabled me to reach the affected organ after displacing the stomach downward. I am convinced that no operation for relief of supposed pathology in the biliary tracts is completed without an examination of the pancreas.

The large number of secondary gall-tract operations is due to errors in diagnosis, failure to remove all calculi, allowing the drainage to close while infection is still active, and failure to remove the gall-bladder in all cases in which there is not a free communication or

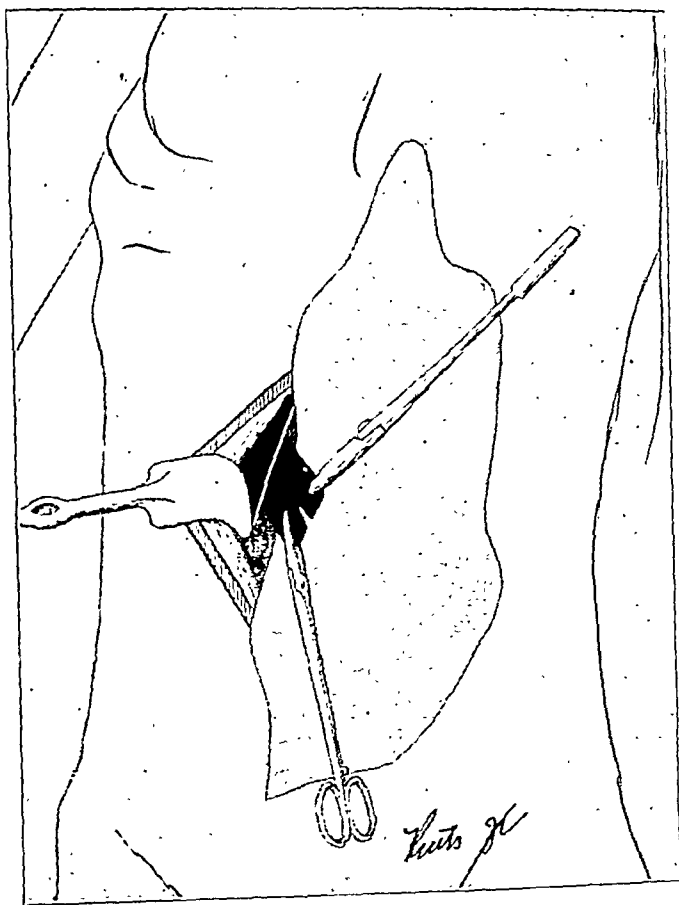


Fig. 1.—Author's technic. Method of incising gall-bladder, the fundus being grasped by flat forceps.

passage in both directions through the cystic duct, provided the common duct is freely patent.

Bile may often pass quite readily from the common duct into the gall-bladder, but returns with much difficulty or not at all by the ordinary contractions of the gall-bladder. In such cases permanent drainage or removal of the gall-bladder can alone afford permanent relief. The removal of the gall-bladder or its entire mucosa down close to the junction with the common duct is imperative to make relief permanent and obviate drainage annoyance.

In many cases of secondary operations following gall-bladder drainage I find the pyloric end of the stomach, first part of the duodenum, gall-bladder, liver and abdominal wall one continuous mass of adhesions. The result is that such a patient is never free from discomfort by pain, dragging, impaired stomach motility and often partial obstruction of the pylorus, which causes gastric dilatation with its accompanying entrapment. Unnecessary and rough handling of abdominal viscera during operation, unnecessary wiping of endothelial surfaces with gauze (especially dry gauze), extensive and unnecessary spreading of infection over clean territory and making no intelligent use of Nature's preventive material at hand are the principal causes of these deplorable and preventable com-

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

plications. Relief of these patients from the operative complications requires much more skill and represents much more danger and difficulty than to deal properly with the original trouble.

In no case should the gall-bladder be attached directly to the abdominal parietes in drainage operations, because of the traction and dragging so liable subsequently to torture the patient. In all cases the drainage tube placed in the gall-bladder should be large and the margins of the gall-bladder should be inverted so that when the tube is removed the margins of the inverted gall-bladder opening at once collapse and promptly close the drainage (Figs. 3 and 4). However, should the bile show the presence of infection (by culture examination) a tube must at once be replaced and drainage maintained until the infection is under control.

The first or original tube placed in the gall-bladder must be secured by a catgut suture placed in the gall-bladder which will hold at least eight days (Fig. 4). The tube should lie free in the abdomen from where it leaves the gall-bladder to the point where it is to pass through the parietes, and at the latter point it should pass through a stab wound made on purpose for it, and should *never* pass (as is the almost uni-

majority of cases primary union can be secured, thus entirely eliminating other preventable complications, namely, suppuration of any part of the main wound, prolonged convalescence and a large percentage of hernias, for which there is *slight, if any, justification* (Fig. 6).

The use of the median incision for operating in all gall-tract cases will make it possible at the same time to deal with any other condition or complication in the abdomen through the same, or an extension of the

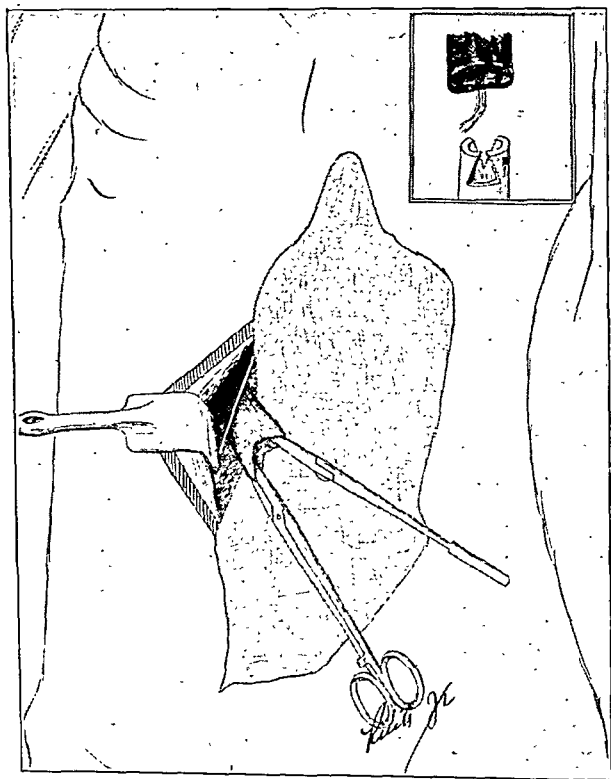


Fig. 2.—Opening in fundus spread, allowing ready access to the interior of the gall-bladder. Method of placing the first row of sutures, and the prepared drainage tube are depicted in the upper corner of the illustration.

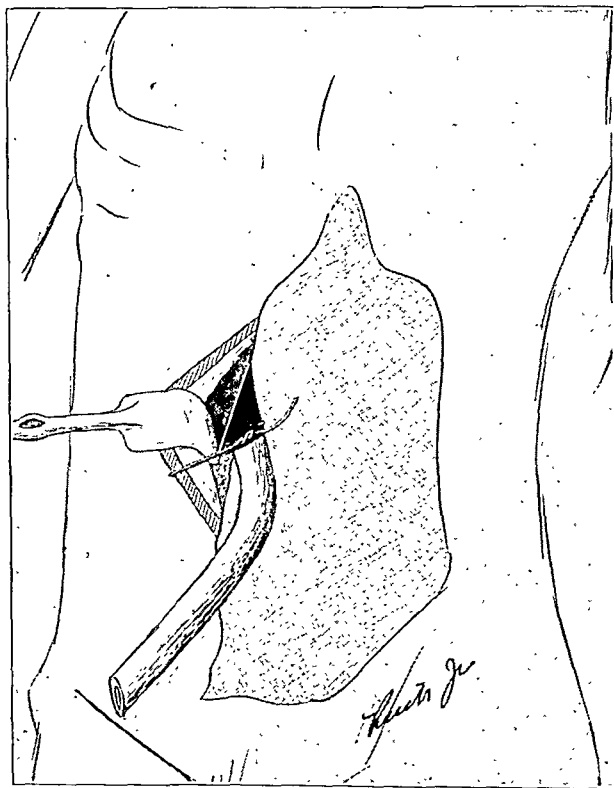


Fig. 3.—Drainage tube *in situ*, and held by the first row of sutures.

same, incision, while it almost removes the temptation to use the main wound for drainage instead of the stab, say 2 inches to the right, which will give vastly better drainage, particularly with the patient lying on the right side. The time-honored incision through the rectus, straight or bayonet, is much more vascular than the median or near median incision, causing some degree of annoyance in operating, and when anything but a simple drainage of a readily accessible, distended gall-bladder is done, requires enlarging to such a degree that more or less sectioning must be done of the nerve supply to the abdominal wall and rectus with permanent sensory paralysis of a portion so that as one patient expressed it, "I am unable to tell whether I am feeling my own abdomen or some one else's except by sight," to say nothing of increased danger to hernia from imperfect motor and nutritive muscular innervation as well as liability to infection from drainage contact with the line of incision. Many gall-tract cases require appendectomy, and in women often attention to the uterus or adnexa as well, in which case the median incision or an extension of it enables all to be done through the one incision with no necessity for any complication whatever arising from such extension and with no added operative difficulty. Any gall-tract operation can be done quite as well, and if complicated much better, through the median incision.

versal custom) *through the main wound* (Fig. 5). The protruding end of the tube should then be connected to a drainage tube long enough to reach a safe distance from the patient (better attach it to the bed rail), where it enters a bottle containing 2 or 3 ounces of 10 per cent. alcohol-carbolic solution, into which the end of the drainage tube is passed so that the end of the tube is kept all the time below the surface of the liquid. This plan enables the main wound to be closed entirely and to remain dry, and in the vast

Removal of the gall-bladder is seldom difficult if done at the first operation under proper technic or as a secondary procedure, provided infection and trauma have not caused extensive and dense adhesions.

In my own work I prefer to remove the gall-bladder by first clamping the cystic duct between strong forceps close to its junction with the common duct, and then divide the duct between the forceps. The forceps placed on the cystic duct close to the common duct must be made to grasp the cystic artery also. The gall-bladder is then readily separated from the under surface of the liver and entirely removed almost without hemorrhage. In other cases in which adhesions are dense and it is difficult to find and follow the cystic duct, though the gall-bladder is accessible, I have found it easier and better to follow the gall-bladder and cystic duct downward from the fundus, splitting the bladder and duct all the way down. In this way I have found it easy to trace and the hemorrhage was

An additional precaution is the placing of an angular or curved glass tubal connection in the drainage tube which passes through the abdominal wall and connecting the other end with a long tube which is passed into the drainage bottle; and by leaving 1 or 2 inches of the glass connection exposed, the presence or absence of drainage can be at once noted on inspection.

In obstruction of the common duct from inoperable carcinomatous conditions, it is wise to make an anastomosis between the fundus of the gall-bladder and the highest point available in the small intestine.

A small Murphy button properly placed makes an admirable anastomosis connection, though I think it wise to attach a string and piece of gauze to the intestinal side to exert traction on the button and prevent its sticking or perchance falling back into the gall-bladder.

When the gall-bladder is not available as above for switching the biliary current into the intestinal tract,

SUMMARY OF OPERATIONS ON THE GALL-TRACT

Case	Age	Stones*	Operation	Complications	Infection	Remarks
1	71	+	Primary	Infarcts in liver profoundly septic	Not determined	Condition critical; pus; extensive adhesions; patient died†
2	39	+	Secondary	Gastrojejunostomy	Colon bacillus	Extensive adhesions
3	60	+	Primary	Profoundly septic	Not determined	Condition critical; pus
4	36	+	Secondary	.....	Mixed, colon bacillus, staphylococcus	Extensive adhesions‡
5	51	+	Primary	Phthisis very adv.	Colon bacillus	Condition critical
6	34	+	Primary	Appendectomy	Colon bacillus	.....
7	42	+	Primary	Appendectomy, trachylorrhaphy, perineorrhaphy and hemorrhoidectomy.	Mixed, colon bacillus, staphylococcus	Pus
8	34	—	Primary	Appendectomy and right oophorectomy	Colon bacillus	.....
9	35	—	Primary	Appendectomy and ten days later pneumonia	Pure streptococcus	Condition critical
10	39	+	Primary	.....	Colon bacillus	Pus
11	50	—	Secondary P. O.	Ventral hernia and extensive adhesions	Not determined	Extensive adhesions§
12	48	+	Primary	Umbilical hernia and later perineorrhaphy and hemorrhoids	Colon bacillus	.....
13	36	—	Primary	.....	Colon bacillus	.....
14	64	—	Primary	Umbilical hernia	Colon bacillus	.....
15	53	—	Primary	Visceroptosis	Colon bacillus	.....
16	45	—	Primary	Appendectomy	Not determined	.....
17	45	—	Primary	Appendectomy	Staphylococcus	.....
18	53	—	Primary	Appendectomy, later phlebitis, septic	Mixed, colon bacillus, staphylococcus, streptococcus	Condition critical; extensive adhesions
19	54	+	Primary; secondary P. O.	Ventral hernia and ovariectomy	Colon bacillus	Condition critical; extensive adhesions||
20	55	—	Primary; secondary P. O.	Hemorrhoidectomy	Not determined	.....
21	53	+	Primary	Appendectomy	Colon bacillus slow in clearing up	.....
22	27	—	Primary	Appendectomy	Pure staphylococcus	.....
23	33	+	Primary	Typhoid fever	Pure typhoid	Condition critical; pus

* In this column + indicates stones, and — no stones. † This was the only death in this series; the other patients recovered. ‡ Mrs. H. L. had one previous cholecystotomy operation for the same condition and required two subsequent operations before recovery was complete and permanent. The last consisted of cholecystectomy. § Mrs. L. E. S. had three previous abdominal sections which were accountable for the ventral hernia. Those three previous operations had been done by the same operator. Conditions unknown to the writer. || The ventral herniotomy complication in this case (Mrs. M. C.) resulted from an abdominal section done by the writer two years previously when an ovariectomy was done for removal of a cyst containing 3 gallons of pus, and her temperature was 103 under profound sepsis.

slight. When the termination of the duct is found, it and the gall-bladder may be dealt with as above, or the mucosa of the cystic duct may be ligated close to the mouth of the duct, all the balance of the mucosa removed and the two outer coats closed over all, leaving a smooth peritoneal surface. This is as effective as removal and it as safely eliminates the gall-bladder as a subsequent annoyance as does the other plan.

A good-sized drainage tube should, however, be sutured in the bottom of the wound in contact with the point of greatest probability of bile leakage, and the patient should lie on the right side for the first forty-eight hours so that there will be free down-hill drainage through the tube to the outside of the body and no tendency to damming back or overflow through the general peritoneal cavity, but an open canal and no back pressure.

and the common duct is largely lost by removal for malignancy, a soft rubber drainage tube may be inserted into the hepatic end of the common duct and secured by encircling catgut ligature and suture while the other end is inserted into the duodenum passing through the intestinal coats diagonally for 1/2 to 3/4 inch. It should have a silk or linen thread attached to gauze in the intestine and fastened to the lower end of the tube. This will make light traction on the tube in all downward peristalsis, and will finally free the rubber, which will pass with the fecal current, but not before Nature's kindly offices have formed a mucous- and endothelial-lined tube or new duct to convey bile into the intestine.

The function of the gall-bladder being to regulate the tension of the gall circulation and not at all for storage purposes readily accounts for the relative

impunity with which it may be removed and the patient suffer no marked inconvenience in its loss.

Avoidance of a return to the old habits of life which caused the original gall-tract infection will usually prevent a return of the conditions which necessitated the first operation, provided the operation be properly done or the patient's condition be such as to warrant a completed operation.

The time has long and forever gone when we operate on the gall-tract simply to remove stones. Recently I drained a gall-bladder for an infection

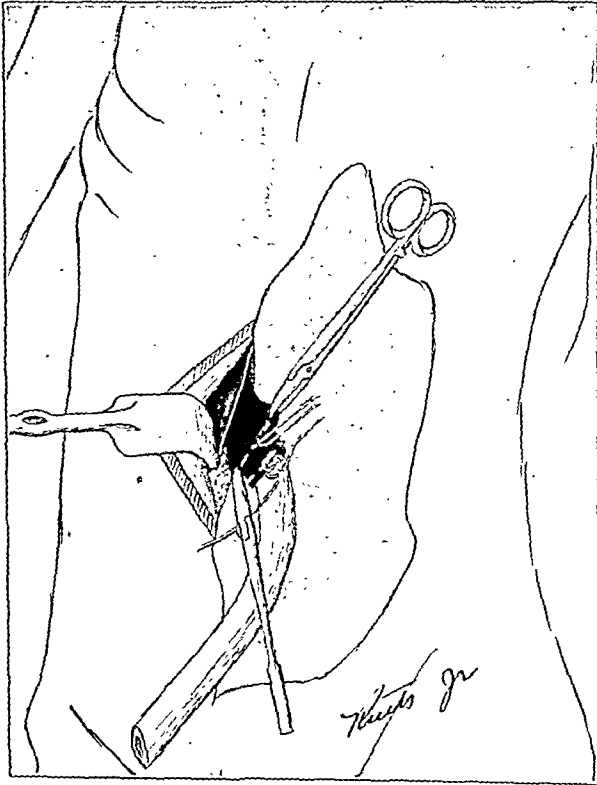


Fig. 4.—Second row of sutures in place and tube ready for inversion into the gall-bladder. Note the suture passing through the tube, insuring against dislodgment by undue traction or other accident. (The suture ends have not been tied and clipped.)

which was only four days old and found that we were dealing with a most intensely vicious, primary, pure streptococcic infection. The progress of this case, however, was favorable until the tenth day when a pneumococcic infection caused complete consolidation of the entire right lung. The latter complication taxed the patient to the utmost and made it impossible to avoid infection of the main wound, which is a rare occurrence in our work, though a good recovery was made.

Three cases are of sufficient interest, I think, to justify reporting in some detail:

CASE A.—Mrs. L., patient of Dr. Johnson, Alden, Iowa, was operated on about six weeks before she came into my hands, and drainage of the gall-bladder was done, but no stones were found. She was first seen by me Nov. 8, 1912, and operated on in Iowa Falls. She had obtained no relief from the previous operation.

Finding the pyloric end of the stomach and the first part of the duodenum firmly attached to the anterior abdominal wall, I released them and re drained the gall-bladder. Relief was prompt and continued so long as the drainage was maintained, but pain returned at once when the drainage of bile ceased.

She returned to me for operation, Feb. 3, 1913, at which time, dreading to remove the omental graft which I had placed to prevent the duodenum and stomach from uniting to the abdominal wall, and not enjoying the prospect of an enucleation of the gall-bladder because of the adhesions which I knew to be extensive and dense, I decided to drain permanently the gall-bladder into the nearest and most readily accessible part of the intestinal tract; this happened to be the hepatic flexure of the colon.

The anastomosis was made with a small Murphy button with string and gauze in the intestine attached to the bottom. Recovery was without incident save that the button was never found, and she was absolutely free from pain and discomfort for five months, when the pain returned as before.

Examination showed that the cholecystenterostomy anastomosis had practically closed so that drainage of bile into the colon from the gall-bladder was no longer free, and the gall-bladder was found distended with bile which had become sufficiently stagnant within the cystic duct to begin the formation of calculi on a mucous cholesterol precipitate. The gall-bladder was accordingly removed after sectioning and permanently and carefully closing the former attachment to the colon. This plan offered the only apparent hope of permanent relief because the cystic duct patency permitted of tolerably free passage of bile into the gall-bladder but would not allow it to return readily by the same route.

CASE B.—Woman, referred by Dr. Will G. Walker, Corydon, Iowa, was operated on in April, 1910, and had two gall-

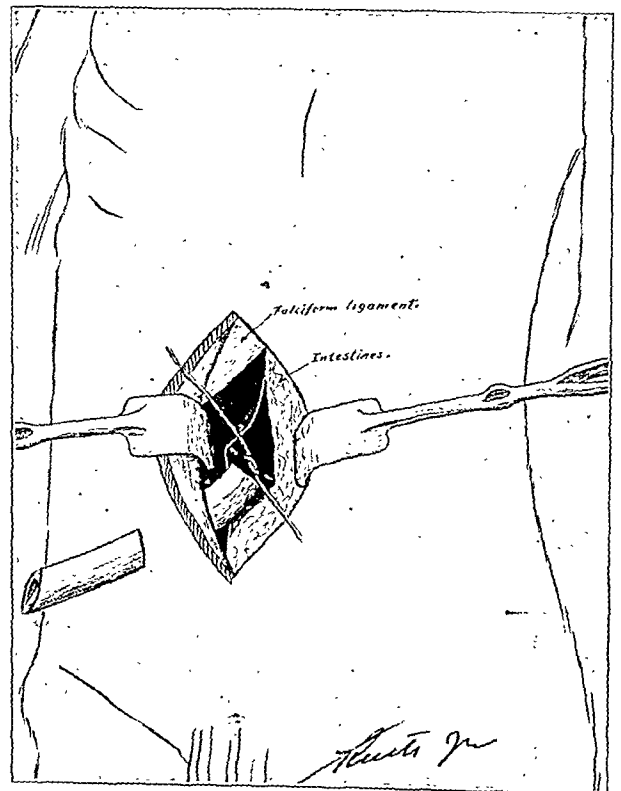


Fig. 5.—Showing position of parts after the tube has been inverted and the free end brought externally through a stab wound. Generally a stitch of silk-worm gut is placed through the skin edges and tube, again insuring against dislodgment of the tube by traction.

stones removed and some work done on the pelvic organs. March, 1911, she was operated on and another drainage of the gall-bladder was done. Neither operation gave any relief from pain or daily vomiting. She was first operated on by me Dec. 13, 1911, for a small inguinal hernia on the right side. Following this herniotomy she did not vomit for five weeks. Then vomiting returned and was as bad as before.

June 24, 1912, she returned for relief from pain and vomiting. Roentgenoscopy revealed dilatation and ptosis of the

greater curvature of the stomach. Impaired motility of the stomach was believed to be due to adhesions. Opening the abdomen disclosed a mass of adhesions so dense and extensive that in the patient's enfeebled condition I lacked the courage to separate them and chose the easier operation, namely, a posterior gastrojejunostomy without loop, in the hope that better drainage of the stomach would control the pain and vomiting. Recovery was prompt and she rapidly gained in flesh and strength, but within a few weeks occasional vomiting and some pain returned, and within five months it was as bad as ever, though on a dry diet she would

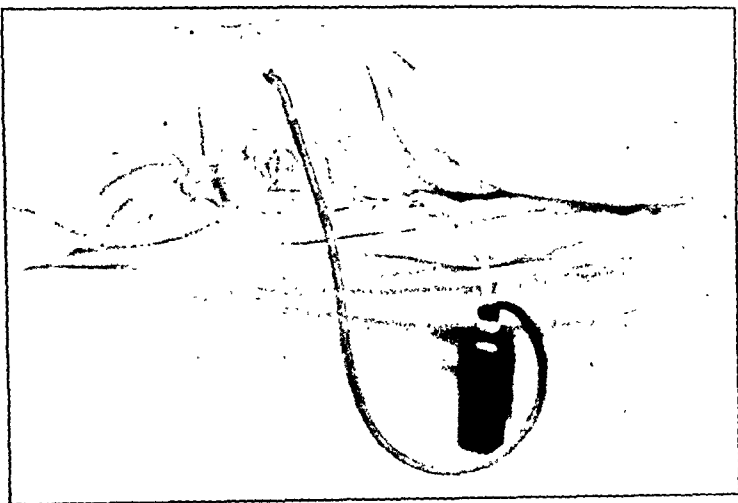


Fig. 6.—Showing arrangement of external drainage system. Skin about median wound remains slightly discolored from iodine stain. Note relation of stab wound to median incision, and the glass connection (siphon drain) between drain proper and rubber tubing. Bottle, containing alcohol-phenol solution, should be lower than depicted, thus obviating all danger of kinking the tube at the neck of bottle.

occasionally gain quite a little for a time in flesh and strength only to lose it again.

May, 1913, careful examination of stomach after Ewald and motor meals showed only evidence of impaired motility, presumably due to the old adhesions following her first two operations.

July 16, 1913, I separated the most extensive and dense adhesions I have ever seen that were uniting stomach, duodenum, liver and anterior abdominal walls, and then over all the extensive area thus denuded I anchored omentum to prevent reformation of adhesions and limitations of the stomach and duodenal functions. Slight acute dilatation threatened for a couple of days, but yielded to the use of the stomach tube, after which recovery was uneventful and the patient gained about 30 pounds in weight in three or four months, but within eight months there was a return of the old symptoms and loss of all she had gained.

CASE C.—Mrs. G., referred by Dr. J. W. Garver, Peru, Iowa, was operated on in January, 1910, for cholelithiasis; in April, 1910, ovariectomy was done; in January, 1911, she was operated on for ventral hernia, and in September, 1911, for appendicitis. She came into my hands July 25, 1912, suffering from severe attacks of pain and vomiting. Pain was vaguely located in her upper abdomen. Her strength, however, was good and she was quite obese. She had dilatation of the stomach, and nearly all the omentum she possessed had been used up in adhesions resulting from previous operations. We had decided on gastrojejunostomy as the safest and surest means of relief, but finding a gall-stone of considerable size, it was removed and drainage of the gall-bladder was done, after which I did my regular posterior gastrojejunostomy without loop, with rubber dam over the posterior edge of the anastomosis. She has for nearly two years since operation been free from pain and vomiting, and has made considerable additions to her already abundant adipose.

These cases are presented as object lessons, in the belief that an analysis of the cases in which bad results were obtained or in which the patients were relieved

only after four or five operations may help us in reaching the goal at a bound, or at most a second trial, in competent hands instead of repeatedly jeopardizing life in new operative attempts in which the surgeon's operative difficulties have been doubled or even quadrupled by previous bungling.

It is to be hoped that a better understanding of the value and use of the omentum may soon become more general among those who essay the art of surgery, that the stomach and intestines particularly may be less impaired in their subsequent functions after all abdominal work, but especially in the upper abdomen. All friction of a delicate endothelial surface in the abdomen by gauze of any kind must be avoided or reduced to the minimum. Especially must no dry gauze be allowed to ever come in contact with any endothelial surface in the abdomen unless it be for the deliberate purpose of destroying or injuring the same and causing adhesions as may be justifiable in attempts to secure omental vascular attachments to the abdominal walls in cases of ascites. The slightest contact of dry gauze with any of the endothelial lining of the abdominal cavity will destroy much of its surface.

Carelessness in failure to protect the intestines and omentum from skin contact, now that the use of iodine in skin preparation has become almost universal, is another cause of adhesion complication in otherwise clean and satisfactory operative procedures. It is not an uncommon sight in the operating room to see large masses of abdominal viscera rolled out of the abdomen on a skin surface, but recently painted with Churchill's tincture of iodine.

COMMENT ON OPERATIONS IN TWENTY-THREE CASES

The twenty-three cases in which operation was performed in the few months covered by the report present an average age of 46 $\frac{1}{6}$ years, the oldest patient being 71 and the youngest 27 years of age.



Fig. 7.—Same as Figure 6 (Case 21), showing abdomen after removal of drainage tube.

Seven of the cases are noted as in a critical condition, by which I mean that they were emergency cases as truly as the average acute appendicitis.

One patient, however, was in the last stages of pulmonary tuberculosis and was operated on because of the terrible suffering from the cholelithiasis from which she begged operative relief. She recovered without incident from the operation, but died from tuberculosis soon after her return home. The operation gave her immediate and complete relief from pain.

There was only one fatality, and that in a man aged 71, who had had biliary obstruction for four months, was in *extremis* with profound sepsis and numerous infarcts in the liver, and the gall-bladder showed necrotic points.

Ether was the anesthetic used in all but the tuberculosis case, in which chloroform was given.

The operation time ranged from thirty minutes to one and three-quarter hours, according to the severity, difficulty and number of complications handled.

Gall-stones were found and removed in fourteen cases, no stones in nine. In Case 9, however, while



Fig. 8.—Showing applicability of method in case of general suppurative peritonitis complicated by acute dilatation of stomach, with enormous amount of fecal matter in the organ. Patient apparently moribund four days before abdominal section. Although median wound was bathed in purulent matter, union of the parts was obtained without any difficulty.

we found no calculi we did find a pure streptococcus infection, and he had a leukocytosis of 62,200, with 90 per cent. of polymorphonuclears. Fifteen cases showed colon bacillus as the infecting organism, three of which had joined company with the staphylococcus, and in one case both streptococci and staphylococci were present.

Other operations and diseases are noted as complications and were present in twenty of the twenty-three cases.

Of these complications nine are appendectomies, two ventral herniotomies, two umbilical herniotomies, two perineorrhaphies, two ovariectomies for ovarian cysts, one trachylorrhaphy, three hemorrhoidectomies and one phlebitis. Three patients had profound sepsis, and in one of these gravely septic cases the gall-bladder mucosa, being necrotic, was removed. In only one case was a cholecystectomy done, and in one the mucosa of the gall-bladder was removed. All cases were drained until the discharge was nearly or quite sterile. In all but three cases the gall-bladder was inverted around the drain and all closed within one week after the drainage tubes were removed, and some did not drain longer than two days after removal of the tube.

One case was complicated by visceroptosis and in that case the ptosed condition received operative attention.

One case developed consolidation of the entire right lung on the tenth day (pneumococcal infection), and in this case the infecting organism in the gall-bladder was a pure primary streptococcus.

In the series of twenty-three cases cholecystotomy was complicated by no less than twenty-nine operative or other conditions of greater or less importance.

If this small number of cases can be said to carry any important lessons for us it would seem to be that cholecystotomy without grave complications should be practically without mortality.

Cholecystotomy is no bar to other operative procedures if the patient is in good condition and the operations be properly done with sufficient dispatch, and whenever possible other important pathologic conditions should be eliminated as far as it is consistent with safety to the patient.

ABSTRACT OF DISCUSSION

DR. FREDERICK COTTON, Boston: We all see a lot of cases in which a secondary operation in gall-bladder surgery is necessary, and we all know the difficulty of preventing adhesions. Dr. Ruth spoke particularly of the median incision, which is not the usual incision made. I think we all agree that the old incisions are unnecessary; but as between the more usual incision at the side of the rectus abdominis and the median incision, there are certain grounds for debate. I have used the median incision for a good while in explorations and used the rectus incision for gall-bladder drainage. The danger of hernia is not common unless a duodenal leak occurs. I have seen only one case after digestion of the abdominal wall for weeks from escaping pancreatic juice. Hernia is not a particularly important factor in these upper abdominal cases if good closure is obtained.

DR. EDWARD MARTIN, Philadelphia: Concerning but one or two points in Dr. Ruth's paper there may be a difference of opinion. Surgeons who operate on the liver and ducts may be compared to plumbers. A first-class plumber always leaves something to go back for. With the surgeon this something is not intentional but is incidental to an incomplete preparation and operative diagnosis. In a number of operations for gall-stones they have not been found, or, indeed, anything else which could be bettered by surgical intervention. Under such circumstances if there be no evidence of back pressure, if the gall-bladder is normal and has not been treated brutally, what particular reason is there for drainage? The gall-bladder is easily, quickly and permanently closed, and the wound convalescence is as prompt as is that from any simple incision. Dr. Ruth advocates a median incision. In certain patients with lax abdominal walls the median incision will reach any point; but why we have adhesions, why we fail to find gall-stones, or to diagnose pancreatic conditions, is because we do not provide adequate access, without visceral and parietal trauma. The vertical cut if made in women with fat, full, tense abdomens gives poor access. If made to the inner side of the middle of the rectus muscle it divides no nerve trunks. If made to the outer side it divides the nerve-supply and is followed by atrophy of the rectus segment. Hernia develops and may become a distressing complication. Moreover, a satisfactory closure of the deeper part of the parietal wound is often difficult or impossible. The incision which gives best access, is least destructive and is most readily closed is first a vertical midline cut for primary exploration; then a transverse cutting of the rectus muscle five fingers' breadth above the umbilicus, a splitting of the external oblique, cutting of the internal oblique and a splitting of the transversalis upward and outward toward the costal border. The whole flap is turned up, when the liver and its ducts are entirely accessible for exploration or operation. Under this incision I have exposed and satisfactorily drained an abscess at the very top of the liver not bigger than a small apple. How many operators have been satisfied with closure of a vertical cut in one of the fat, full abdomens, the stitches tearing through the posterior rectal sheath on the slightest tension? The view of such a wound from within the abdomen gives a picture widely differing from that suggested by the final neat skin closure. With the vertical and transverse cut, the stitches hold because the direction of their pull is across that of the

muscles and fascia, the wound comes together easily and the ultimate closure is good. Two fingers' breadth above the umbilicus is the usual position of the transverse tendinous lines of the rectus muscle. The suture is somewhat easier if the cut be carried through the line. This is, however, not necessary as mattress sutures readily approximate and hold in place the cut muscle surfaces.

DR. PHILANDER HARRIS, Paterson, N. J.: In operating on the gall-bladder for gall-stones I have employed one or other of the vertical or downward incisions. I have operated a few times by the central incision but not sufficiently often to become familiar with it. If I should adopt the central incision I question whether I could so easily deliver a portion of the liver as I can with the vertical incision. Whatever I might say against the central incision would be theoretic and not entitled to any consideration. I have employed nothing but stab-wound drainage in operating for gall-stones in more than eight years. I certainly feel that the best way to get undesirable secretion out of the body is to bring it through a stab-wound incision, getting as far to the right as has been indicated by Dr. Ruth. I do not drain through the incision, nor do I sew the gall-bladder to the peritoneum. The advantage, I believe, of stab-wound exit and efficient drainage established in that manner arises from the fact that it is on lower ground. Unless the patient is turned well to the right it is a decided advantage to have the drainage at the lower point of the incision and to the right of it. The operation might, perhaps, be improved by employing two large tubes instead of one. I have employed twin drainage with stab-wound exit for five years. With the double drainage two tubes come out of the stab-wound exit and from each of them there is a drainage pail. One tube may enter the gall-bladder; the other, any desired place. The gall-bladder is sewed with very fine catgut around the tube which enters it, and the catgut by which the fundus of the bladder adheres to this tube is carried out through the stab-wound by means of the forceps. In the first twenty-four hours blood comes out through the little triangular space. In two or three days the wick is withdrawn and the tubes may be left as long as desired. I believe that the operation of cholecystectomy is gaining ground while the operation of cholecystotomy is taking a less important place.

DR. D. N. EISENDRATH, Chicago: We are passing through the same stage with regard to common-duct surgery that we have passed through with the gall-bladder proper. There was a time when one could only make a diagnosis of gall-stones when the patient had jaundice. That we cannot have common-duct stone without jaundice is a belief that had better be dropped. I find that the secondary cases have been those in which the gall-bladder has been taken out and in which the operator did not have the courage to take out the common duct. It is time for us to decide that when we operate for gall-bladder disease we have to consider also the condition of the common, hepatic and cystic ducts. If I find gall-stones in the gall-bladder it is the last part of my operation. As Dr. Martin said, we cannot get as good exposure of the common duct through the median as through the lateral incision. Kehr, a year ago, reported 54 cases in which he had examined the common duct and in 32 palpation was negative and yet stones were found. In over 50 per cent. of my cases when palpation was negative, by opening the common duct I have found stones. My technic is to leave the gall-bladder alone at the early part of the operation, take a couple of traction sutures and open the common duct between them, explore toward the ampulla and up into the hepatic duct. A considerable number of the so-called secondary operations are due to overlooking common-duct stones. Another element of failure is leaving a gall-bladder in, which ought to have been taken out at the first operation. Taking the gall-bladder out in the secondary operation is most difficult. Everything is so adherent that you cannot get a line of cleavage. This can be avoided if the gall-bladder is taken out primarily. When the common duct is enlarged to the size of the index finger, or its walls are thickened or there are many small stones in the gall-bladder the common duct

must be explored. If there is marked pancreatitis, drainage of the common duct is also of much benefit. It has been shown experimentally that at the end of three weeks the bladder, no matter how badly infected, is sterile.

DR. J. H. CARSTENS, Detroit: It seems that all these cases depend on circumstances. We can remove the gall-stones, sew up the gall-bladder and drop it back. If there is an infected gall-bladder this cannot be done. It can be done only with the mulberry variety of gall-stones; this I often do. In clean cases I make the incision transversely in the direction of the fibers of the external oblique muscle, separating them and pulling them apart. Then I separate the fibers of the rectus in the opposite direction without cutting them and pull them apart. I separate the transversalis fibers and take hold of the gall-bladder, opening it and remove the stone or stones, and carefully close it, bringing the edges together and amplifying it with a row of Lembert sutures. I then drop the gall-bladder and close the opening in three layers. The incision is always very small. I thus have not cut any nerves and there is no danger of hernia. I make the same incision in ordinary cases, when I want to drain but do not attach the gall-bladder to the incision. In some cases there are extensive adhesions but they have produced no symptoms. I generally can feel the ducts, and if I find no trouble I let the adhesions alone, because if they are broken they may produce new adhesions that will cause serious symptoms. I separate only enough adhesions to get to the top of the gall-bladder, which I open, scoop and float out the gall-stones, and insert a drainage-tube. If I have an infected gall-bladder I do not operate until the acute inflammation has subsided, if possible. Then I make as small an incision as possible, pull up the gall-bladder and stitch it all around to the peritoneum without opening it. I have thus the peritoneum clean and closed and can open the gall-bladder and wash out the gall-stones without danger of infection. Sometimes I also take out the gall-bladder if it is gangrenous, or remove only the lining membrane. As a rule, before I touch the gall-bladder I explore the ducts. If they are pervious and contain no stones I let them alone; if they are large I split them up, but I would not split up every one when there is nothing the matter with it. In some of these cases we also have a loose liver coming down and causing great distress. In such cases I generally scrape the surface of the liver and the anterior peritoneum behind the ribs, shove the liver into place as nearly as possible and then stitch the gall-bladder to the incision, which I make quite high, and it helps materially, I think, to keep the liver in place, although the latter may become sufficiently adherent to relieve the symptoms without the attachment of the gall-bladder.

DR. JOHN A. MCGLINN, Philadelphia: I take the rather advanced stand that gall-stone disease is essentially a surgical and not a medical condition and if diagnosed the stones should be removed. I do not believe that gall-stones may be innocuous for a number of years and no pathology result from their presence or the original cause of the stones. Four years ago I studied and reported observations on the pathologic findings in 506 cases of gall-stones. In all of these cases gross pathologic lesions were found either in the biliary tract or adjacent organs. It is interesting to note that the lesions were practically always multiple. This explains why it is so often necessary to reoperate in gall-stone cases. The tendency is simply to remove the stones when found and not seek for other pathologic lesions. It should be borne in mind that the whole right upper quadrant of the abdomen should be explored in operating for gall-stone disease, so that lesions of various parts of the biliary tract as well as those of adjacent organs can be dealt with.

DR. F. D. GRAY, Jersey City, N. J.: The question of double drainage mentioned by Dr. Harris should, to my mind, only arise under exceptional circumstances. It might be considered when the field of operation has been soiled or when there is uncontrollable oozing of blood. Again there may be a doubt in one's mind whether the sutures will hold in unusually softened tissues with a resultant leakage. If

there is any necessity for drainage, except that of the gall-bladder, it appears to me that a drainage tube will, in that location not be sufficient, on account of the tendency of septic fluids to gravitate into the lower abdomen. The most effective thing under these circumstances is to introduce a strip or two of iodoform gauze beneath the gall-bladder (or its stump in cases of cholecystectomy), below which is inserted a layer of dental dam, to prevent adhesions, the whole of which constitutes a coffer dam, as it were, to intercept and carry all drainage fluids to the surface. In my opinion this is more effective than a second tube can be and I have had good results with the method.

DR. CHANNING W. BARRETT, Chicago: The necessity for the median incision can be done away with by a double incision instead of a compromise one to reach two extreme ends of the abdomen. The compromise incision never reaches either end very well. If the gall-bladder is to be operated on, a 3-inch incision will attend to that. This can be made without injury to the abdominal wall and nerves.

DR. C. E. RUTH, Des Moines, Iowa: I use the stab-wound drainage because properly used it will never produce hernia. No drainage, however, can be continued through any wound without some infection about it, and for that reason there is a liability that if we use the main wound for drainage we will add to or cause infection that could be avoided. So far as hernia is concerned, possibly it is not common in the East, but it has been with me a source of great trouble, not in my own cases, however. The secondary cases coming to me with hernia are not a few. In determining the time of drainage we have, in practically all our cases for the last year and a half, made repeated cultures before we allowed closure of the wound. We never allowed the wound to close until the primary infection had become decidedly diminished in virulence. The staphylococcus from the skin we try to avoid by taking our cultures far down in the gall-bladder. With reference to stones being the cause, as mentioned by Dr. Martin, for this operation, I believe they are the primary cause of infection. I never object to the straight median incision and I increase the size if necessary to get the space for rolling the liver out. I do object particularly to the old longitudinal incision that starts under the rectus and which, if prolonged, does cause destruction of the nerve-supply to a portion of the abdomen. If one prefers to use two incisions I have no objection, but I prefer one. I have never found it necessary to use more than one, or to curve the incision to the right. I can conceive of the possibility for it, but so far have not found it necessary. There is no question that the use of two tubes when the peritoneum is soiled, is good practice. I have abandoned stitching the gall-bladder to the peritoneum because of the traction. I like the use of the round ligament for the suspension of the gall-bladder.

TREFOIL OR STELLATE KERATECTOMY FOR ANTERIOR STAPHYLOMA *

S. LEWIS ZIEGLER, M.D.
PHILADELPHIA

Keratoplasty has been successfully employed to remedy certain corneal defects, but only a moiety of procedures have been devised to meet the indications present in anterior staphyloma. When a protruding but circumscribed corneal ectasia has proved to be more or less obstructive to the vision, and the remaining tissues of the globe have not been seriously involved in the pathologic process, conservative surgery demands that a mobile globe shall be preserved, and, whenever it is possible, that a modicum of useful vision shall be secured.

To meet these indications I devised, in 1895, a simple form of corneal excision, which I have designated as *trefoil keratectomy*. It is adapted chiefly to those cases in which a limited portion of the cornea is staphylomatous and in which correction of the ectasia can be made by the removal of a three-leaved flap from the lower part of the pendulous cornea (Fig. 1). When, however, the whole cornea is involved and a four-leaved flap must be excised to correct the deformity, the procedure is designated as *stellate keratectomy*.

PRELIMINARY TREATMENT

Full antiseptic precautions should be observed, as most cases of corneal staphyloma are the result of infectious processes, such as trachoma, suppurative conjunctivitis and other mucopurulent discharges. A course of sedative treatment should, therefore, be applied to the palpebral conjunctiva. As many of these cases are complicated by lacrimal blennorrhea or obstruction, it is often necessary to perform rapid dilatation of the tear-duct. If this is indicated, it should be done at least one week prior to the corneal excision. It is often wise to irrigate the nose with an antiseptic wash.

ANESTHESIA

This operation has been performed under cocaine-epinephrin anesthesia, but full ether narcosis is to be preferred, since the restlessness of the patient might interfere with the proper introduction of the sutures, or even cause an injury to a transparent lens, if such should be present.

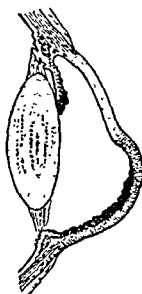


Fig. 1. — Vertical section of anterior staphyloma, showing clear cornea above and ectasia below. The thickened iris-tissue has been glued to the cornea by plastic inflammation.

INSTRUMENTS REQUIRED

In my earlier operations I used a speculum, Graefe knife, fixation forceps, a pair of small, strong scissors, a needle-holder, needles and fine black silk sutures. In cases of emergency an iris forceps, iris scissors, silver spoon and spatula, and a wire loop may be required and should be included on the tray. In a later method I changed the technic by substituting a keratome for the Graefe knife, and a corneal punch (Fig. 2) instead of the scissors. The two methods appear to be equally efficient, although in certain cases the punch cannot be used because of lack of space in which to introduce it.

DESCRIPTION OF OPERATION

Three methods will be described, (a) trefoil keratectomy with the scissors, (b) trefoil keratectomy with the punch and (c) stellate keratectomy with both scissors and punch.

Trefoil Keratectomy

Scissors Method.—First Stage: With the speculum inserted and the globe firmly held by fixation forceps, the operator should first inspect and outline the exact area to be excised (Fig. 3A). The Graefe knife is then passed horizontally through the base of the staphyloma from the temporal to the nasal side, keeping the edge of the blade turned directly forward, as for a Saemisch incision, and drawing it backward and forward but not allowing it to emerge fully until the aqueous fluid has completely escaped (Fig. 3B).

* Read before the Section on Ophthalmology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

Second Stage: One blade of the scissors is now introduced beneath the upper margin of the horizontal incision, a little to the right of the center (2 or 3 mm.), and a long vertical incision made. A second converging cut is then made, the same distance to the left of the center, which joins the first at the apex and thus makes a V-shaped incision and opening (Fig. 3 C).

Third Stage: The two corners of the opposing wound-margins are successively grasped with the forceps and a triangular piece (Fig. 3 C, upper margins) excised by scissors from each corner, thus making a three-leaved opening (Fig. 3 D).

Fourth Stage: The vertical wound is closed by two or three fine black silk sutures passed through the opposing wound-margins and tied (Fig. 3 E). The horizontal wound is then sutured in like manner (Fig. 3 F).

A Kalt suture (linen) may, if preferred, be inserted through the outer layers of the cornea and tied as a mattress-suture. The cut surfaces must be carefully approximated at all points.

Punch Method.—First Stage: A vertical incision is made through the base of the staphyloma with an angular keratome (Fig. 3 G), and the inferior blade of the punch is passed into the anterior chamber and beneath the cornea, while the punch is closed with a

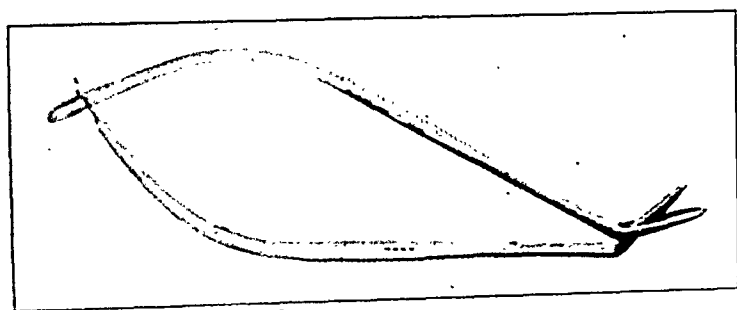


Fig. 2.—Corneal punch, with long oval points. The spring was adapted from McClure's iris scissors.

short, quick thrust, thus excising the left lateral flap (Fig. 3 G, shaded part).

Second Stage: The punch is removed, introduced on the other side of the wound-edge, and the right lateral flap is excised in the same way (Fig. 3 H, shaded part).

Third Stage: The upper margin of this long, oval wound is now grasped at its center by the punch and a vertical piece excised (Fig. 3 I, shaded part), leaving a trefoil opening (Fig. 3 D).

Fourth Stage: The sutures are now inserted to close first the vertical wound (Fig. 3 E) and then the horizontal wound (Fig. 3 F), as previously described.

Stellate Keratectomy

This operation is chiefly indicated when the staphyloma involves the whole of the cornea, or when a central mushroom staphyloma has developed. It can be performed either with the knife and scissors or with the keratome and punch, as is preferred.

First Stage: A horizontal incision is made in the center of the cornea, with the Graefe knife or with the keratome (Fig. 3 J).

Second Stage: The upper and lower vertical flaps are excised with the scissors or with the punch (Fig. 3 J).

Third Stage: In like manner the two horizontal flaps are excised (Fig. 3 K).

Fourth Stage: Each section of the stellate¹ incision is closed by a single suture, and a central mattress-suture is finally inserted.

COMPLICATIONS

If, by chance, abnormally high tension should cause extrusion of the lens, or if vision can be improved by the removal of a cataractous lens, the loop or the silver spoon should be used for this purpose and the toilet of the wound made before tying the sutures. If it seems possible to improve the vision by iridectomy or by De Wecker's iridectomy, this may be done before the wound is closed, but *pari passu*, it is better to postpone such an attempt until after healing has occurred.

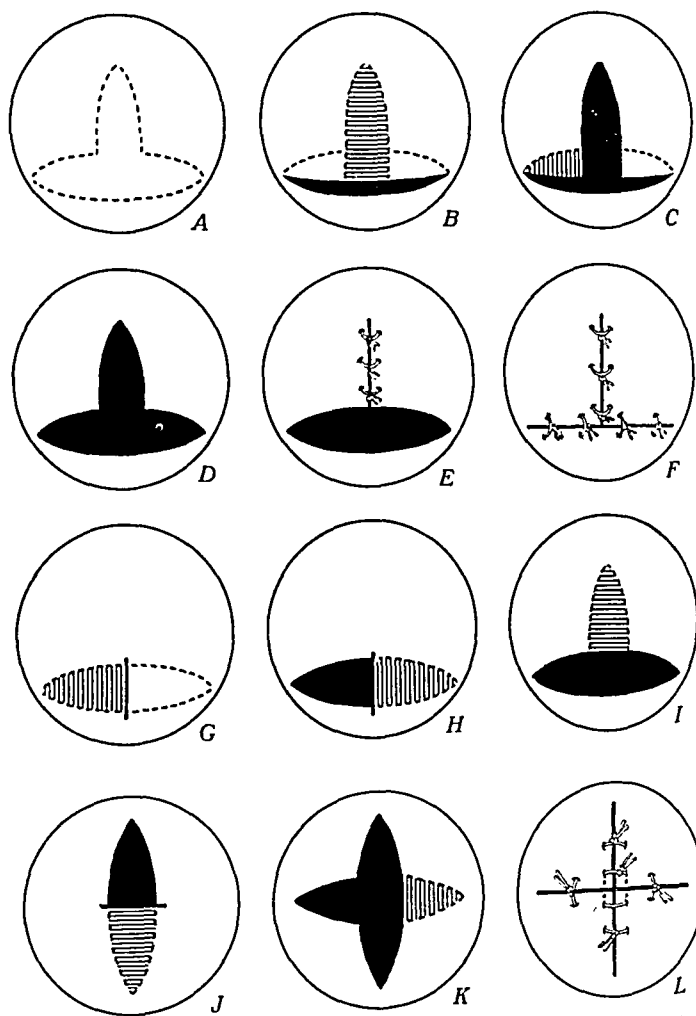


Fig. 3.—Incisions and sutures for both trefoil and stellate keratectomy; A, three-leaved flaps outlined; B, corneal incision below, à la Saemisch, shaded part of upper flap ready for removal; C, upper flap excised, left tip shaded; D, trefoil keratectomy completed; E, vertical wound sutured; F, both vertical and horizontal wounds sutured; G, vertical keratome incision for punch operation, left flap shaded; H, vertical keratome incision for punch operation, right flap shaded; I, right and left flaps excised, upper flap shaded; J, horizontal keratome incision for stellate keratectomy, upper flap excised, lower one shaded; K, upper, lower and left flaps excised, right flap shaded for removal; L, stellate keratectomy completed and sutures inserted.

POSTOPERATIVE TREATMENT

Mercuric chlorid ointment should be inserted into the conjunctival culdesac and a light bandage with a cresol solution compress adjusted. A slow-healing wound may be stimulated by touching it with a weak solution of silver nitrate. An infected wound should have an application of liquor formaldehydi, 0.5 per cent., and ice-pads should be applied. A wound that

1. Since preparing this paper my attention has been called to the star-shaped incision of Attias, recently devised and published in the *Ophthalmoscope*, January, 1914. His sutures cross over from the upper right flap to the lower left flap and vice versa.

slightly gapes or shows other irregularity should receive a gentle touch with the hot galvanocautery point.

REPORT OF CASES

I shall briefly cite three interesting examples of this keratoplastic procedure in types that are quite diverse, the first occurring in an extremely attenuated cornea that had yielded to a superficial necrosis through the erosive action of a blennorrhea, the second in a cornea that was practically normal except in the ectatic area involved, and the third in a cornea that was greatly thickened by plastic deposit and made staphylomatous by the increased intra-ocular tension behind it.

CASE 1.—Margaret M., aged 19, was first seen by me during an attack of typhoid fever, March 17, 1895, in consultation with Dr. George Morley Marshall, the present otologist at St. Joseph's Hospital, who was at that time in charge of the medical service. There was primary infection of the ethmoid and antrum, with secondary involvement of the ears and eyes, the former through an infectious otitis media purulenta and the latter through a profuse blennorrhea of the lacrimal sac, which kept both eyes bathed in a purulent discharge in spite of free irrigation and ice-padding. The left eye showed multiple areas of corneal ulceration with some ectasia. The cornea of the right eye was markedly involved by sloughing keratitis. One week later it was found necessary to perform a Saemisch incision in the right eye to check the corneal slough, but the globe proceeded to shrink and was finally enucleated, June 10, 1895, at which time rapid dilatation of both tear-ducts was performed, *ad maximum*.

Oct. 28, 1895, an examination of the left eye showed adherent leukoma with marked anterior staphyloma, the ectasia being very thin and bulging forward below, as illustrated in Figure 1, while a small area of clear cornea was still preserved along the upper margin. The eyelids could not be closed over the staphyloma. The vision was limited to light perception and light projection. There was no discharge present.



Fig. 4 (Case 2).—Result of keratectomy in the right eye; clear cornea above; flat leukoma below; final vision 20/100.

As the patient had been able to count fingers before the pupil was drawn into the scar, and as the globe seemed to be healthy, I decided to make a plastic operation on the cornea. Ether was administered and trefoil keratectomy was performed, the primary incision being made with a Graefe knife through the base of the staphyloma, after which a large vertical flap was cut out with the scissors and the two lateral tips later excised. The iris was freed from above. The corneal wound was closed by fine black silk sutures, the vertical first, and the horizontal last. Healing was uneventful and the cornea became nicely flattened. Vision had recovered to the degree of 10/200 at the time of patient's discharge from the hospital.

CASE 2.—Mary McC., aged 19, applied to Wills Eye Hospital March 20, 1908, suffering from corneal staphyloma of the right eye, down and in. Scar was somewhat weakened at lower margin. Cornea was clear above. The globe was not involved. Tension +1. Iris was adherent to the scar. The lesion was the result of a blow received during childhood. Iridectomy was performed by me four years ago.

April 24, 1908, patient was admitted to the hospital during the internship of Dr. J. Milton Griscom, at present assistant surgeon to the hospital, to whom I am indebted for these notes. Trefoil keratectomy was performed and the wound sutured.

May 1, 1908, sutures were removed.



Fig. 5 (Case 3).—Large leathery staphyloma excised in the right eye, leaving a well-flattened cornea.

May 3, 1908, shallow anterior chamber, due to a small break in the line of the wound.

May 5, 1908, deep anterior chamber. Wound closed.

May 20, 1908, patient was discharged cured. Cornea was firm and flattened. Vision 20/100. The present appearance of the right eye is well shown in Figure 4.

CASE 3.—Alphonso R., miner, aged 47, came to Wills Eye Hospital, Dec. 4, 1908, with ulcerative keratitis and adherent leukoma, the result of severe traumatism from a flying piece of steel, six weeks before. Perforating ulcer, 3 by 4 mm.

Dec. 6, 1908, Stilling's operation with lead style and rapid dilatation of tear-duct was performed to eliminate the danger of lacrimal infection.

Jan. 13, 1909, iridectomy was made for visual purposes.

Jan. 29, 1909, patient was discharged without visual improvement.

July 12, 1909, patient returned with large staphyloma of cornea at the site of the old scar. Marked interstitial thickening of the cornea, which resembled leather in looks and feeling. Tension was +2. Under ether anesthesia three triangular areas were excised with the corneal punch (trefoil keratectomy) and the necessary sutures inserted. The sudden release of intra-ocular pressure caused the lens to be extruded, but no other complication ensued.

Aug. 20, 1909: Recovery was uneventful. Patient was discharged with a well-flattened scar but no improvement in vision. Figure 5 shows the appearance of the eye at that time.

1625 Walnut Street.

ABSTRACT OF DISCUSSION

DR. JOHN GREEN, JR., St. Louis: The surgery of corneal staphyloma dates from the Alexandrian period of Greek and Roman civilization. It is not surprising that these beauty-loving peoples should have devised methods to diminish a deformity which, in its higher degrees, is irksome to the victim and repulsive to those with whom he comes in contact. The method adopted was that of ligation: A needle bearing a doubled thread was passed through the base of the staphyloma; the needle then was cut off, and the tumor tightly enclosed within the bight of the thread above and

below. The method was modified by passing needles similarly armed, at right angles, then tying off the tumor in four sections. Beer, in 1805, proposed and practiced simple abscission, without suturing the gaping wound. Critchett, 1863, in order to retain a part of the vitreous, passed curved needles through the sclera and ciliary body, entering above and emerging below the staphyloma, which was then abscised. Knapp, 1868, modified the method by quilting his sutures horizontally through the conjunctiva and episclera. DeWecker, 1873, circumcised the conjunctiva at the base of the staphyloma, abscised the protruding mass and drew the conjunctiva together with a purse-string suture. The outcome of these various operations is often very satisfactory: a globular mass of varying size, freely movable by reason of undisturbed muscular attachments. The artificial eye is often remarkably life-like, fully as prominent as its fellow and with really extraordinary lateral and vertical mobility.

It has been contended, and with some justice, that in the case of laborers, a blind eye, even though unsightly, that is painless and free from congestion, is better for the individual than the best prosthesis. If then, a protruding staphylomatous mass can be flattened by operation, and the result be a quiet blind eye, only disfigured by a flat scar, it is pertinent to inquire whether such a procedure may not only be justifiable but also definitely indicated. For partial staphyloma Dr. Ziegler's trefoil keratectomy appeals to me as an excellent measure. It seems possible that the technic might be simplified by omitting the approximating sutures and covering the cornea with a double pedunculated conjunctival flap. Possibly a double overlying flap, drawn from either side of the cornea (similar to Francis' double flap for scleral wounds) might serve still better. More and more ophthalmic surgeons are using these flaps to great advantage in both linear and jagged wounds of the cornea, and I see no reason why such a flap should not be serviceable in the condition under discussion. The indications for stellate keratectomy for total staphyloma in a blind eye seem to me far less clear. I should feel that an eye so operated on was somewhat of a menace to its fellow. I should prefer either to leave it alone or to enucleate, with a fat, glass or gold ball implantation in Tenon's capsule.

DR. JOHN E. VIRDEN, New York: I have had no experience with Dr. Ziegler's operation, but in connection with partial staphyloma I have had recently two or three pleasing experiences without surgery in cases of early staphyloma of the cornea, in which I followed a suggestion I read, by some foreign authority; that is, the dropping into the eye three times a day of a 1:1,000 epinephrin solution, which reduces the tension and allows nature to fill up the gap. I have had two very beautiful recoveries from that procedure.

DR. S. LEWIS ZIEGLER, Philadelphia: With reference to the use of epinephrin in the treatment of staphyloma, this suggestion was made by my colleague on the staff of Wills Hospital, Dr. Paul J. Pontius, who published a series of cases in the *New York Medical Journal*, Sept. 28, 1912. It is a most excellent procedure, but the preparation must be used in full strength (1:1,000) and instilled 3 times a day. It is chiefly applicable to cases of partial or total slough of the cornea, where suppuration has ceased and ectasia is just beginning to manifest itself. Under this treatment the regenerative process will so stiffen the cornea as to prevent the formation of staphyloma. It has proved very successful in my hands. The conditions that I referred to in my paper were not the conditions that Dr. Green mentioned in the first part of his discussion. I was not referring to staphyloma that involved more than the corneal tissue and did not intend to include staphyloma that extended into the ciliary region. The suggestion of covering the wound with conjunctiva I think is an excellent one, if the technic of Kuhnt is followed. On the other hand, there are many cases in which the cornea is so stiffened by reduplication of tissue and formation of plastic deposit that the wound when it is incised does not coaptate and you must draw it together with a suture. The sutures can be put in by my method, by Kalt's or by any of the others. I do not think that we have anything to fear from the use of sutures in this character of tissue, or in other types of leukomatous cornea. They have been used very freely and

successfully. I have nothing further to add to the operation except to say that I feel sure those who will try it in the cases indicated will find it a successful procedure, without danger of complications and with great benefit and satisfaction to both patient and surgeon.

IMMUNITY IN MEASLES

CHARLES S. WOODS, M.D., IOWA CITY, IOWA

Hektoen¹ concluded from his study of experimental measles that "the virus of measles is present in the blood of patients with typical measles some time at least during the first thirty hours of the eruption."

It would seem that Hektoen's experiments prove beyond a doubt that measles may be transmitted by injecting the blood of a person having measles into another person in normal health. One would expect, therefore, that infants *in utero* would be liable to contract measles if the mother should happen to have the disease during pregnancy. I wish, therefore, briefly to relate an observation which I have had the opportunity of making on this point. About seven years ago I called to see a woman who presented the usual signs of measles. She had never had the disease. Two children in the family were just recovering from it. She was in the eighth month of pregnancy. I was greatly concerned and hourly expected a premature birth of the child. The attack of measles was quite typical. The patient was very uncomfortable, chiefly because of the bronchial involvement. She passed through the attack without any unfavorable results. About three weeks later I delivered her of a normal child.

I supposed that the child had acquired the disease from the mother, and perhaps he did. Only recently, however, I have received word from the father that the child had a rather severe attack of measles this spring. And while it is true that measles may attack a person a second, and even a third time, this child while *in utero* must have had the most ideal opportunity for acquiring immunity against this disease. It is generally believed that if a pregnant woman is infected with syphilis late in pregnancy the child usually escapes.

It is impossible to say that this child did not have measles *in utero*. Children have been born with measles, small-pox and certain other diseases which were certainly contracted from the mother.

This case emphasizes the very great difficulty in securing immunity, as well as the remarkable power of the virus of measles to invade the human organism.

RETROPERITONEAL HERNIA DUE TO AN ABERRANT MIDDLE COLIC ARTERY*

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Retroperitoneal hernia is not a common condition, but it occurs with sufficient frequency to warrant a very careful study of its cause, the symptoms it may produce and its treatment. A critical analysis of the whole subject will be found in the monograph written by Sir Berkeley Moynihan entitled "On Retroperitoneal Hernia," a second edition of which was written

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.
1. Hektoen: Experimental Measles, *Jour. Infect. Dis.*, 1905, ii, 233.

in collaboration with Mr. J. F. Dobson in 1906. This work contains a very complete bibliography, and the author has narrated in detail many of the cases which have been recorded in the literature. The etiologic factor responsible for the production of this class of hernia has, in the vast majority of instances, been demonstrated to exist in the numerous peritoneal folds and fossae which are produced in the normal development of the intestinal tract and its serous covering. These folds and fossae are formed mainly in four distinct regions. They are as follows:

1. Duodenal folds and fossae in the region of the duodenojejunal juncture. Here we have, in addition to a few extremely rare types, the two chief varieties of (a) "left duodenal hernia," and (b) "right duodenal hernia."

2. Peritoneal folds and pouches in the region of the cecum and vermiform appendix. These are responsible for a considerable variety of cases of "pericecal hernia."

3. The fossa at the base of the mesentery of the sigmoid flexure of the colon. Hernia into this fossa has been described from time to time.

4. The region of the "lesser sac" of peritoneum and the foramen of Winslow. Hernia occurs into the lesser sac of peritoneum through the foramen of Winslow, or again there may be hernia into the lesser sac through an abnormal aperture, as through the lesser omentum, the gastrocolic omentum, the great omentum or the transverse mesocolon.

Among the earlier writers on this subject we have Treitz, Waldeyer, Eppinger, Toldt and Jonnesco. The Hunterian lectures of Treves in 1885 on the anatomy of the intestinal canal and peritoneum in man make a well-known monograph containing a study of the peritoneal fossae. Again Huntington in his exhaustive and beautifully illustrated work on "The Anatomy of the Human Peritoneum and Abdominal Cavity Considered from the Standpoint of Development and Comparative Anatomy" (1903) gives us an account of the various fossae concerned in these forms of internal hernia. The writings of Lockwood and Rolleston and of Berry on this subject may also be referred to.

The frequency of retroperitoneal hernia may be judged from the fact that Moynihan was able to collect from the literature 68 cases of left duodenal hernia, 17 cases of right duodenal hernia, 19 cases of pericecal hernia, 2 cases of intersigmoid hernia and 12 cases of hernia into the foramen of Winslow.

The case recorded in this paper is possibly unique, occurring as it does in connection with an extremely rare abnormality, namely, the existence of an aberrant origin and course of the middle colic artery. In this instance the artery in question arose from the right common iliac artery and proceeded upward to its destination in the transverse colon. In relation to this aberrant vessel a peritoneal pouch was developed which contained the whole of the small intestine. The case is of further interest because, while apparently all cases hitherto recorded were either found accidentally post mortem, or at operation performed for symptoms caused by the hernia (frequently strangulation), in the present instance an operation was undertaken for digestive disturbance due to an hour-glass stomach, and the retroperitoneal hernia found on opening the abdomen was not accountable for any symptom whatever save a slight degree of ileostasis which appeared in the Roentgen-ray findings.

The history of the case is as follows:

J. H., man, aged 60, complained of epigastric pain for three years. As a rule the pain came on some hours after eating, but in this respect the history was somewhat vague. Eighteen months prior to operation he had a severe attack of hemorrhage, vomiting a large quantity of blood, and for several days subsequently blood was passed in the stools. This was the only time at which he suffered from hemorrhage. He had lost weight and there was an excess of free hydrochloric acid in the gastric analysis. There was a tumor situated immediately above and to the left of the umbilicus which, on examination, seemed to be incorporated in the left rectus muscle. The tumor was oval, its long axis being vertical. It was about the size of a large lemon. Roentgenograms after a bismuth meal showed an hour-glass contraction of the stomach with a marked permanent incisura toward the cardiac end. A condition of ileostasis was also noted.

A diagnosis was made of gastric ulcer with cicatricial contraction producing an hour-glass stomach. It was also

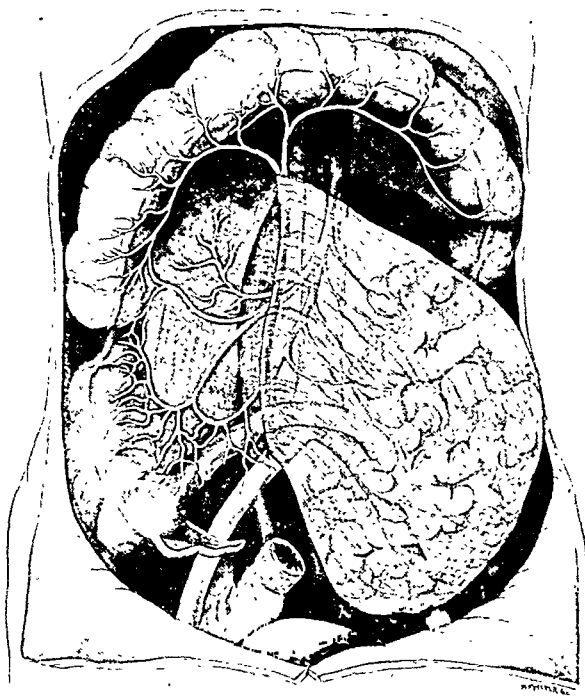


Fig. 1.—Retroperitoneal hernia due to an aberrant middle colic artery. The artist has represented the sac as if it were transparent in order to indicate its relations as described in the text.

suggested that a chronic infection of the abdominal parietes had extended from the ulcer, following in all probability a slow perforation with adhesions.

The abdomen was opened, the stomach was found adherent to the parietes and the left rectus muscle for about 4 inches of its extent converted into dense cicatricial tissue which cut almost like cartilage. In the attempt to separate the stomach the cavity of that viscus was opened. A clamp was laid flat on the anterior surface and closed so that the adherent portion of the stomach was isolated and further leakage prevented. The stomach was separated from the parietes by removing a slice of the cicatricial tissue of the parietes along with it. A partial gastrectomy was performed between Payr's gastrectomy clamps, and the affected portion of the stomach removed. Immediate anastomosis of the remaining parts of the stomach was now done and the abdominal parietes closed.

This patient exhibited a remarkable condition of internal hernia in which the entire small intestine was contained in the hernial sac. When the abdomen was first opened no small intestine was visible, but one found a large flabby sac

occupying a position chiefly in the left lumbar region and extending deep down into the pelvis. The opening of the sac lay immediately to the right of the middle line and was bounded anteriorly on its free margin by a structure which extended from the brim of the pelvis upward towards the transverse colon. On picking up this structure, which felt like a thick cord, one was surprised to find that it pulsated and thus it became obvious that a large artery formed the margin of the opening. By pinching the vessel at two points separated from one another by about an inch, it was quite easy to determine by compression the direction

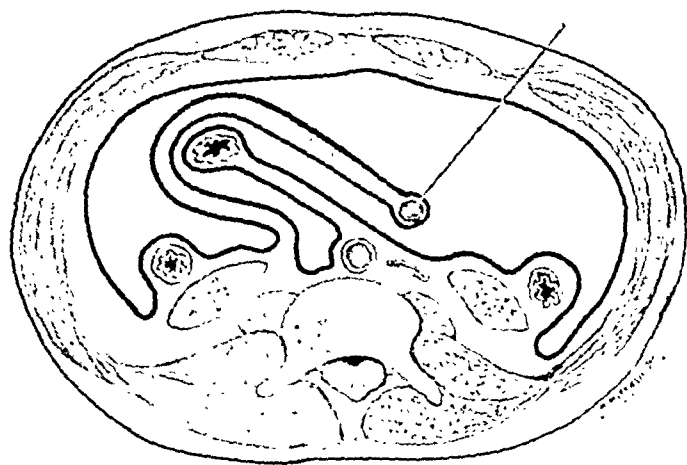


Fig. 2.—Retroperitoneal hernia due to an aberrant middle colic artery (indicated by the arrow). Diagrammatic representation of a transverse section illustrating the relations of the folds of the peritoneum forming the sac.

of the blood-flow within the vessel. Pinching at a lower point obliterated the pulse above, while pinching it above had no effect on the pulsation below. It was quite obvious that the current was from below upward, and on further examination we determined that the artery arose from the right common iliac. On examination it also became quite obvious that the artery was distributed to the transverse colon and in fact was an aberrant middle colic artery.

On examination of the peritoneal sac one found that, with the exception of about 2 inches of the lower end of the ileum which passed out to join the cecum, the entire small intestine was contained within the peritoneal sac. The patient was apparently not suffering any inconvenience from the conditions which one found, and in the belief that in all probability this man, who was now 60 years of age, had had this hernia without inconvenience for the greater part of his life, and further because of the fact that it seemed almost impossible to obliterate the sac efficiently had one thought it necessary to do so, it was determined to leave matters as they were.

The patient made an excellent recovery from his stomach trouble and has remained perfectly well since the operation, which took place about six months ago.

The diagrams which I here reproduce (Figs. 1, 2 and 3) illustrate the position of the hernia and its relations.

The opening of the sac was quite large so that the fingers of one's hand could be thrust within it without difficulty. The intestine was quite readily pulled out of it and there was no constriction placed on the bowel—in fact, it seemed hardly possible for strangulation to occur. The fundus of the sac was quite free so that one could lift it up out of the pelvis, and it seemed as if one could almost shake the intestine out of its acquired bag. The descending colon lay behind the sac, the transverse colon above it and the ascending colon immediately to the right of its neck. The fixed point of the duodenojejunal junction was entirely within the sac, lying under shelter of its upper portion, and the only piece of small bowel passing through the mouth of the sac was the ter-

minal 2 inches of the ileum where it passed to the ileocecal juncture.

It would appear that the vast majority of cases of retroperitoneal hernia have a very intimate relation to the course of some particular blood-vessel; in course of development the blood-vessels lie in a retroperitoneal position, and as they course to or from the various viscera, which they supply with blood, they maintain their position in the same plane of tissue, passing between the two leaves of the mesentery in reaching the small bowel or running behind the posterior parietal peritoneum to reach such viscera as the ascending colon, which as a rule possesses no mesentery.

In the early embryo of the sixth week the intestinal canal runs a straight course and the blood-vessels are distributed to its various portions as branches of the aorta which proceed to their destination between two folds (right and left) of peritoneum, described as its mesentery. Subsequently this simple arrangement becomes complicated by rotation of the intestine and by the fusion of different layers of peritoneum. The result of these processes is to produce various folds of peritoneum and certain fossae related to these folds. These fossae normally persist in such localities as the duodenojejunal juncture, the ileocecal region, or at the root of the mesentery of the sigmoid. The free margin of the gastrohepatic omentum bounding the foramen of Winslow has a similar origin. In these

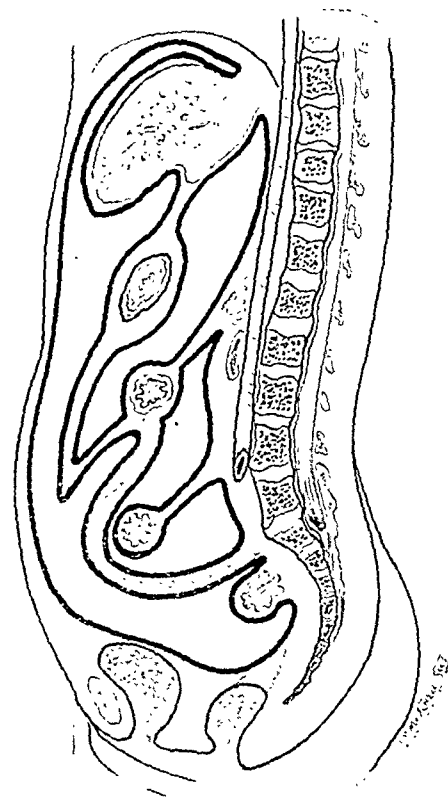


Fig. 3.—Retroperitoneal hernia due to an aberrant middle colic artery. A diagrammatic representation of a sagittal section illustrating the relations of the folds of peritoneum forming the sac.

regions therefore and in relation to these fossae, hernias are prone to develop, and the fossae are deepened as the pressure of loops of bowel is brought to bear on them until eventually large sacs may be formed, accommodating, it may be, many feet of bowel.

The fold bounding the neck of the fossa on its anterior or ventral aspect is usually occupied by a blood-vessel, and unquestionably the vessel is respon-

sible in these instances for the production of the fold and the fossa behind it. Hence in the neck of the sac in a retroperitoneal hernia we usually find a blood-vessel which forms its anterior boundary. Thus in "left duodenal hernia" the vessel found on the ventral margin of the orifice of the sac is the inferior mesenteric vein to which is, as a rule, closely applied the left colic artery, forming the so-called vascular arch of Treitz. In right duodenal hernia the vessel concerned is the superior mesenteric artery. In pericecal hernia it is the ileocolic or ileo-appendicular artery which lies in the fold bounding the fossa. The sigmoid vessels are similarly related to the neck of the sac in "intersigmoid hernia," and one finds the hepatic artery and portal vein with the bile-duct bounding the foramen of Winslow on its anterior aspect.

We may assume that the aberrant middle colic artery in my case produced a peritoneal fold as it coursed from its origin from the right common iliac artery to its destination in the transverse colon. A fossa occurring in a position posterior to the fold would permit of the formation of a hernia. Hence in this instance the neck of the sac on its anterior aspect contained in its free margin the middle colic artery.

It is a point of great practical importance to note the fact regarding the relationship of large and important blood-vessels to the neck of the sac; otherwise, in cases of strangulation particularly, one might inadvertently sever the vessel in relieving constriction and thus jeopardize the vitality of a large amount of bowel.

The anomalous origin of a "middle mesenteric artery arising from the common iliac and supplying vessels to the transverse and descending colon" has been described by Hyrtl. I have been unable to consult his original paper but a reference to this fact will be found in Quain's "Anatomy," Volume II, Part 2, published in 1899.

Moynihan describes various methods which have been adopted in individual instances to relieve constriction in strangulated hernias of this type so as to deal with it efficiently and yet to preserve the important vessels concerned, without injury. Thus the sac has been opened at a point distant from its orifice. Distended loops of bowel have been punctured and emptied of their contents in order that reduction of the size of the bowel may be accomplished. The intestine is then dislodged from the sac through its orifice. Subsequently obliteration of the sac near its orifice is brought about by sutures introduced in such fashion as to prevent interference with the circulation of blood through the vessel. In one instance the inferior mesenteric vein at the margin of the orifice was cut across but it was found to be thrombosed—presumably collateral circulation had already been sufficiently established to prevent gangrene of the bowel, as the patient recovered.

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ABSTRACT OF DISCUSSION

DR. CHARLES A. POWERS, Denver: The rare condition which Dr. Primrose has described is unique, and I doubt whether we will ever see a similar case. Dr. Primrose wisely permitted this small intestine occupying the very large sac to remain where it had been lodged for several years. It was doing no harm and the patient made a good recovery. A man of lesser experience and less wise judgment might have

attempted a radical cure of this hernia and thereby had a fatal result. The situation found was an unexpected one and emphasizes the fact that when we find conditions of this nature which have existed for a long time within the abdomen and which will probably do no harm, it is our duty to let them alone.

DR. WILLIAM B. COLEY, New York: I have had no experience with the particular type of intra-abdominal hernia described by Dr. Primrose. He has, however, referred to two cases of intersigmoid hernia reported prior to 1906. I believe my own case, published in the *Annals of Surgery*, July, 1909, is the only one observed in this country. Furthermore, I think my case remains unique from the fact that the hernia occurred in an infant 3 days old. The only symptoms were apparent pain (judging from the almost constant crying of the infant) and gradually increasing distention of the abdomen. When the diagnosis of intestinal obstruction was made, the condition of the child was too desperate to permit of operation. He died shortly afterward. I performed a necropsy, and found practically all of the small intestine in a retroperitoneal pouch in the intersigmoid fossa. An additional point of interest in my case was the fact that the intestine had ruptured and the whole abdomen was filled with its contents.

DR. E. WYLLYS ANDREWS, Chicago: The most valuable contribution we have in Dr. Primrose's paper is probably the one referred to by Dr. Powers, namely, the impossibility of radical operative procedure in many of these cases. What was not perhaps quite so forcibly emphasized as it might have been is the anatomic fact that every one of these retroperitoneal hernias is a constriction band formed by a blood-vessel. In the foramen of Winslow is the gastrohepatic omentum which contains the hepatic artery. It goes without saying that we dare not interfere with these structures in endeavoring to reduce. We have a left colic and the right colic form, and in all these cases constricting bands seemingly in the blood-vessels, the accidental injury or obstruction of which in relieving the band would cause a gangrene of a segment of the large or small intestine. So not only is it proved that it is the part of wisdom to let these alone when they are not causing obstruction, but it is equally true that it is impossible to relieve the obstruction sometimes when the hernial content is strangulated. We can only make some form of stoma. I refer to this in more detail in the Hernia Section of the American System of Surgery. Ample experience shows that a strangulated hernia, for example, through the foramen of Winslow, cannot be removed. The problem is then of saving life, and that can only be brought about by some method of anastomosis, external or internal. It may become the part of wisdom not to try to reduce the bowel, but to relieve its constriction and distention by some kind of a stoma or anastomosis, or by resection of the gangrene. This is further complicated in diagnosis by the fact that practically none of these cases has ever been diagnosed before operating. They are not hernias which are known and operated on as hernia. They come to us as cases of intestinal obstruction, for which we do an emergency operation. Therefore, in some respects, it seems as if they hardly deserved classification as hernia at all.

The Importance of Observation in Diagnosis.—Which is the worst error, to fail to observe certain conditions, or to observe them and interpret them incorrectly? In the writer's opinion, the first is much the worse error. Observation is a matter of patience, training and thoroughness, in all of which a man may improve himself, but the use which he makes of his observations is partly a matter of his mental equipment. True, he can train his powers of thought and judgment to some extent, but we vary greatly in the quality of our cerebral cells, and the saying of the father of medicine, "Experience is fallacious and judgment difficult," is always true. To observe correctly and decide wrongly is sure to happen to the best of us, but to observe carelessly happens only when we permit it.—Thomas McCrae, *Canadian Med. Assn. Jour.*

FURTHER OBSERVATIONS ON THE
HEMIOPIC PUPILLARY REACTION
OBTAINED WITH A NEW CLIN-
ICAL INSTRUMENT*

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The need of such a test as the hemiopic pupillary reaction, if it holds in cerebral cases any of the topical diagnostic possibilities originally suggested by Hed-
daeus and later elaborated by Wernicke,¹ is so great that no labor should be spared fully to estimate the value of every promise it may offer.

In a paper² before this Section last year a complete historical summary and bibliography were given of this subject and of the Wilbrand test.³

PREVIOUS OBSERVATIONS

It will suffice here to recall some cardinal points from the researches of previous observers. Most important was the work of Hess in clearly showing what a great stumbling-block the phenomenon of dispersion light within the eye media had been in both

on the retina and decreases farther away from the image, but is still strong enough at right angles to the axis of the ray to render the path of the ray visible, if observed in a dark room through a trephined scleral window in the freshly enucleated eye. A somewhat similar phenomenon is commonly observed when a searchlight is seen playing about in different directions on a dark night or when a beam of light passes through water, especially if any tur-

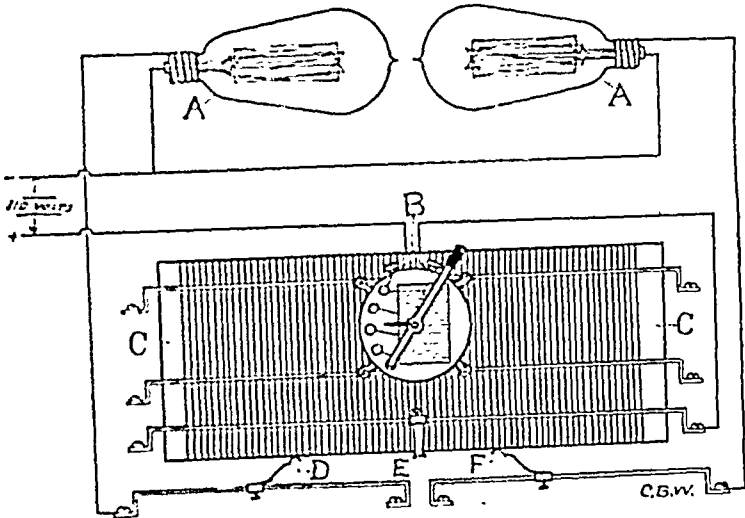


Fig. 1.—Diagram showing method of controlling lighting current in hemiopic pupillary apparatus: *AA'*, 60-watt tungsten lamps; *B*, rheostat controlling house current; *C*, slate slab wound with German silver wire; *D*, *E*, *F*, sliding contacts controlling current supplied to each lamp.

making and interpreting observations, and, since it has been frequently noticed in discussion that this phenomenon is still apparently a hazy concept to many, it may be worth while to dwell on it for a moment. By dispersion light is understood that light which in traveling the media of the eye is diverted by diffraction, refraction, etc., in all directions from the rectilinear path of the ray entering the eye. Dispersion light is strongest immediately about the image

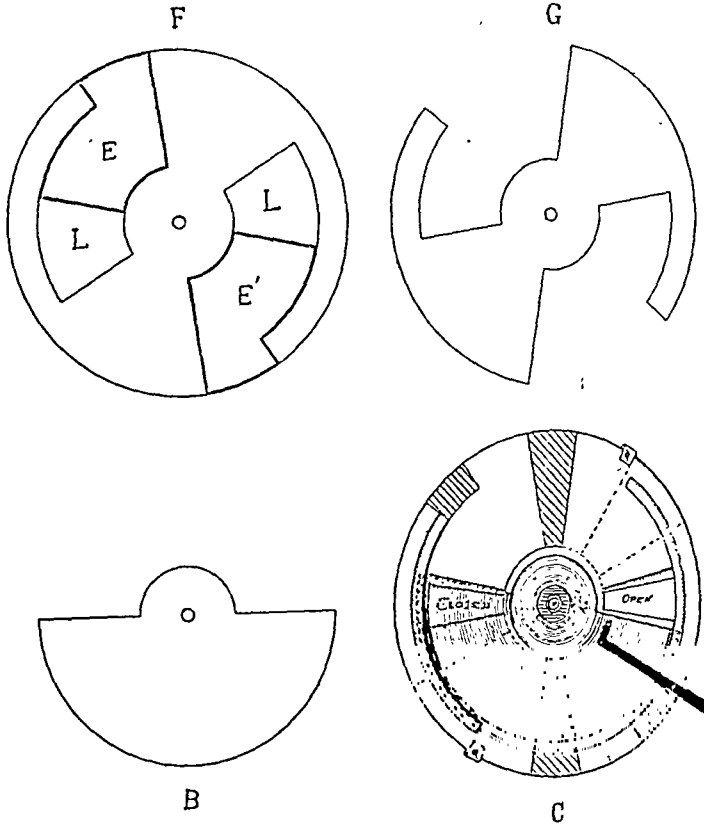


Fig. 2.—Plan of rotary shutter, assembled in *C* from segments *F*, *G* and *B*, in the position where the equal areas *L* and *L'* are cut down to about one-half full size.

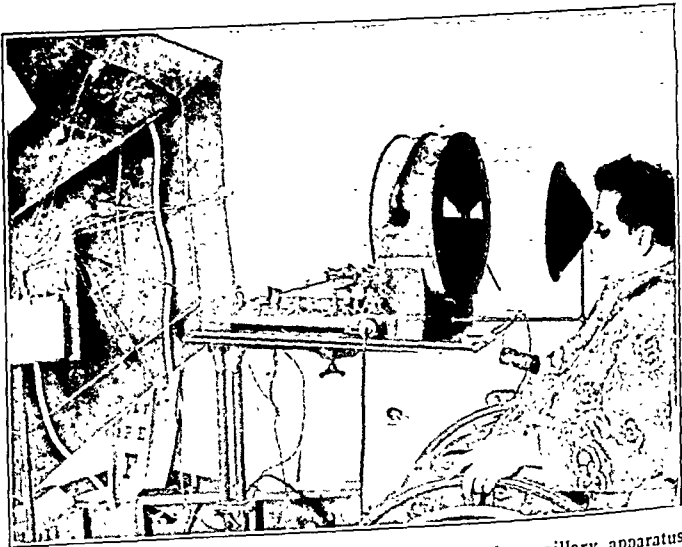


Fig. 3.—Patient in position before the hemiopic pupillary apparatus. At the left a portion of the new apparatus for performing the Wilbrand test on these patients may be seen.

idity is present. Dispersion light may also be observed in one's own eye entopically when a beam of light is so arranged as to fall entirely on one's blind spot.

Hess, in one of his crucial experiments, placed a small light on a perimeter-like apparatus so that the light could be moved off or on the blind spot. The consensual pupillary reaction was noted by means of an entopic pupillometer on the other eye. He noted

* Read before the Section on Ophthalmology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

¹ From the surgical clinic of Prof. Harvey Cushing at the Peter Bent Brigham Hospital, Harvard Medical School.

² On account of lack of space this paper has been abbreviated for THE JOURNAL. It will appear in full in the Transactions of the Section and in the author's reprints.

1. In the Wernicke reaction, as the phenomena was later commonly designated, a slender beam of light was thrown on the blind and then on the seeing retina of a hemianopic eye. Briefly, if there was no difference in pupillary reaction the lesion was central or posterior to the corpora quadrigemina and the reflex arc. While if there was a difference in reaction, the lesion was anterior or peripheral, interrupting the reflex arc from the blind retina to the sphincter iris.

2. Walker, C. B.: Topical Diagnostic Value of the Hemiopic Pupillary Reaction and the Wilbrand Hemianopic Prism Phenomenon, with a New Method of Performing the Latter, THE JOURNAL A. M. A., Sept. 27, 1913, p. 1152.

3. The results of further investigation of the latter subject are too space consuming to be included in this report, but will be given later.

no pupillary reaction when the light was moved concentrically with the fixation point above or below the blind spot onto the seeing retina; indeed, sometimes there was a slight reaction in moving from retina onto blind spot due to reflection from the bright optic disk. If, however, the light was moved slightly toward the fixation point, a marked reaction resulted. Therefore he concluded that a small area about the macula contained all the pupillomotor fibers, so that when a ray of light was thrown on the peripheral retina, the resulting pupillary reaction was due to dispersion light stimulating the macula rather than to direct stimulation of the peripheral retina. Further, he showed that the exact center of the macula was the most sensitive point in the macular region. From a study of these facts it was at once obvious that previous observations were not at all well controlled with respect to dispersion light, the properties of which really constituted the crux of the whole situation.

This fact having been established, the next step was the production of a satisfactory instrument which would perform the test and at the same time control the dispersion light. The latter could not be dispensed with but could be made to affect the macula with constant strength in one of two ways: first, by rotating a light at fixed radius from the fixation point from blind to seeing field, and, secondly, in a "hemikinetic" manner, to use the term of Hess. This involves two equal areas of light, symmetrically disposed about the fixation point, and so arranged that each area may be exposed alternately as the other is closed. The intensity of the areas of light must be controllable about the point of photometric balance, and during the period of change the total area exposed must be constant and equal in amount to the full area of one of the lights. In this way the direction of the light entering the eye may be changed, but the amount of dispersion light reaching the macula remains constant.

Hess devised an instrument of sliding shutter type to accomplish this. Two equal vertical openings of rectangular shape equidistant from the fixation point were illuminated from behind through milk glass. The openings in the sliding shutter which exposed the two areas alternately were so placed that the moment one area began to be cut off the other area was exposed by the same amount. This fulfilled all the conditions except that of symmetry during the period of change, when light is cut off from one side of one area but added to the opposite side of the other area, as is of necessity the case with all plain sliding shutters. The result of this arrangement may be a pupillary jump during the change, since at that instant more dispersion light reaches the macula from one light by addition than is subtracted from the other light. This is most obvious in the mid-position when the two half areas are found to be asymmetrically disposed with respect to the fixation point by exactly one-half the width of either area. Sliding shutters which will be light-tight have a tendency to stick at times and the resulting movement of the whole instrument is then such as to produce an oscillating series of asymmetrical positions. Further to minimize these objections, the areas have to be made as narrow as possible so that a pupillometer must be used to make observations satisfactorily, on account of the low intensity of direct illumination.

In order to obviate the difficulties of symmetry, the rotary shutter described in my last communication was devised and two or three hemiopic reactions were observed with it, but while it solved the problem of symmetry well enough, it was small, crudely made and poorly lighted as compared with the present instrument, so that a pupillometer was necessary to make observations in most cases.

DIFFICULTIES WITH RECENT METHODS

This last point brings up a consideration of some of the difficulties encountered in making observations with the various forms of pupillometers. Questions of pupillary illumination or of observation ability on the part of the patient form a basis for most of these difficulties.

Thus in the entopic pupillometer the patient observes his own consensual pupillary reaction. A dispersion circle limited in size by the pupillary margins is projected on the retina by an encapsulated point source of light fixed close to the eye and with all extraneous light excluded. Any change in the size of the pupil is noticed as an enlargement or contraction of the retinal dispersion circle which is projected into space as a sort of moon or round window of light surrounded by darkness. While the patient notices this phenomenon and reports on it he must also keep his other eye carefully on the point of fixation and pay no attention to the shifting lights in the field of vision. If a field defect is present in both eyes the entire dispersion circle will not be seen except by special arrangement, such, for instance, as was used on the instrument presented last year.

While this method is the most sensitive we have, it has the common error of all monocular pupillometers of damping, as it were, pupillary dilatations, since as dilatation comes on more light is admitted to the eye, producing a tendency to contraction. Conversely, when pupillary contraction comes on, it is exaggerated, more light being excluded. But still more confusing is the peculiar pupillary bounce present at all times with most patients, and probably augmented by the preceding factors together with psychic or perhaps accommodative reflexes, although no change in light intensity has taken place. Altogether, the mental and physical condition of patients with field defects resulting from brain tumors is usually such as to inhibit the individual attention necessary for trustworthy observations with entopic method.

With the objective method, the monocular pupillometer being used, the main difficulty arises from the amount of light necessary to give a good view of the pupil. This degree of illumination is about the same in amount whether it be from the light in a pupillometer such as described in the previous paper,² or whether it be daylight or light from any source whatever, and the amount is such that as soon as the pupil is properly illuminated, it is at the same time markedly contracted. Under these conditions when a certain increment of light is added to the light already strongly contracting a pupil, the reaction may be hardly perceptible, while if the same increment of light is thrown on a dark adapted retina the reaction will be very noticeable. If the test lights used on the other eye are not of considerable strength, the stimulation may not be, in certain cases, sufficient to travel the consensual route and override the strong stimulation already present in the consensual eye sufficiently to

give reactions that can be interpreted as other than equivocal or negative.

The logical sequence of these considerations was the desire to construct an instrument which would utilize the same light, necessary in any case for observation of the pupil, also to perform the hemiopic pupillary test. In addition to these requirements other desirable conditions to be fulfilled would be the possibility of varying the size of the areas symmetrically within all necessary limits and of rotating either area about the point of fixation from the blind to the seeing field. Further, both lights should be under complete control so that the intensity of either one could be varied above or below or made exactly equal to that of the other, or that the intensity of both could be varied together without disturbing the ratio of intensity between them. Such an instrument would also come much nearer satisfying the demands of a routine clinical instrument since the usual pupillometer trappings could be dispensed with, or used at will, and the pupillary reflex directly observed. Accordingly, somewhat over a year ago an instrument, of which a description follows, was constructed to meet, as well as possible, the imposed conditions.

THE NEW INSTRUMENT

A diagram of the necessary light control is shown in Figure 1. The lights, *AA'*, are new 60-watt tungsten filament lamps selected from a large stock as nearly equal in all measurements as possible. From the wiring scheme it will be seen that they are connected in parallel. One side of each is directly connected to one side of the house current (110 volts). The other side of each lamp is likewise connected to the other side of the house current but must first travel through a set of resistances. The whole current first passes through a rheostat, *B*, whereby it may be varied in five steps from nothing to full strength. From the rheostat, the current then passes to the fixed bar of the sliding contact, *E*. This sliding contact, together with similar contacts *D* and *F*, may be moved laterally in contact with the edge of a slate slab *C* measuring 1 by 12 by 8 inches and wrapped with No. 26 B & S gage (0.016 inch diameter) German silver wire, the interval between the turns of the coil being about 0.2 cm. This size of wire was found by experiment to have the necessary resistance to regulate the individual lamps, and still would not burn out under the contacts, with ordinary care. From the contact the current divides, passing through a variable amount of resistance to contacts *D* and *F*, and thence through their individual fixed bars, and on to their respective lamps. If now we wish to decrease the intensity of the light *A*, we have simply to move the contact *D* farther out or to decrease *A'* to move the contact *F* farther out. If now with either of these contacts at any distance we wish to produce further change in the relative light intensity, we may simply move the contact *E* between the two contacts *D* and *F* until the desired point is reached without adding extra resistance but merely readjusting that already in use. Thus, if necessary, we can throw the whole or any part of the resistance on the slab *C* into the circuit of either light or divide it between them in any ratio. For purposes of measurement, the slab resistance is divided into ten divisions (points) each way from the center.

These two lights are encased end to end in the diameter of a heavy tin drum of about the size of an

ordinary snare drum (14 inches diameter by 6 inches depth). Access to the interior is allowed by two doors in back. The inner surface of the drum is enameled white, and has two movable partition wings of the same curvature as the circumference so that when not in use they can be made to lie flat against the curvature of the drum. When it is desired to prevent one light from contributing more or less to the other, these wings may be turned inward to a corresponding degree or may be moved until they touch the axle for maximum effect. This axle in the center of the drum is hollow and acts as a hub posteriorly to receive the fixed axle on which the whole drum may be revolved, but anteriorly it has two large holes bored in it to transmit light to the fixation point, and still farther forward acts as an axle for the movable segments of the rotary shutter, which makes up the front of the drum.

The rotary shutter is an elaboration of the same type as that previously described. The segments (Fig. 2) necessary to make up the shutter were cut out of heavy tin, although a similar weight in sheet brass would probably have worked up with less tendency to warp. The first disk, *F*, has two equal openings *L* and *L'*, the shape being such as to give the maximum area for the minimum movement of the shutter. The inner margin of each area is on an arc of 1 inch radius from the center and the outer margin on an arc of $5\frac{1}{2}$ inches from the center, at maximum opening an arc of 45 being subtended. On the quadrants, *E* and *E'* is placed another segment of size and shape to fit the interval left by the next superimposed segment *G*. Thus a smooth surface is provided for the shutter to move on below, and above the proper level is obtained on which to solder an overhang under which the shutter may pass and give a light-tight closing. The back of this disk carries two plates of milk glass covering the openings. The anterior end of the hollow axle also has a milk-glass window on which is marked a letter *A* and a dot, serving as a fixation point.

The next superimposed segment, *G*, serves mainly the purpose of symmetrically regulating the size of the lighted areas, but at the same time it carries two circular arms extending along the outer margins of the lighted areas, forming a smooth course on which the edge of the shutter may travel under cover of another overhang providing a light-tight margin. This disk is not fixed to the drum as the first one is, but is free to rotate when the clamps holding it to the first disk are loosened. The shutter is a semi-circular disk, *B*, actuated by a jointed hand lever, as is shown in the assembled shutter *C* drawn in the position where the lighted areas *L* and *L'* have been cut down to about one half their full size.

To eliminate any asymmetry that may be due to reflection from the patient's face, a wide, short cone, truncated to fit the patient's eye, is provided on an adjustable support, so that the distance from the fixation point can be varied within any desirable limits, from 10 to 20 inches usually giving satisfactory illumination. A patient in position before the instrument is shown in Figure 3.

METHOD OF EXAMINATION

Before making any tests, in order to avoid as much as possible any psychic or accommodative changes or any tendency to loss of fixation, the patient is familiarized with the movements of the shutter, until the

shifting of light areas ceases to be of interest. The room is then darkened to exclude all asymmetrical light, and with the shutter at mid-position or entirely open on the blind side, so that light adaptation may be kept equal, or as low as possible before the test is made, the patient is placed in position before the instrument with one eye covered, and the light is gradually increased until the movements of the iris can be accurately followed. This light strength varies slightly, depending on the color of the iris; it is greater for the darker irises. The patient is now told to sit back and close the eyes before proceeding with the observations, in order to increase the dark adaptation, which has a tendency to increase the difference in reaction, and to avoid fixation fatigue. Previously, of course, the lights have been photometrically balanced by means of the sliding contacts and further adjusted to the normal eye so that the pupillary reaction is the same from both lights.

Observation of direct pupillary reactions may be made with the unaided eye, or a short-focus telescope may be used. A very simple aid is made by rolling up a tube of stiff paper which will hold a magnifying glass in one end and fit snugly about the observer's eye at the other end, thus at once cutting out shifting and somewhat confusing illumination on the observer's eye, and enlarging the pupillary movements. This tube may be held in the mid position to avoid asymmetrical reflections. Observation of the consensual pupillary reaction may be effected directly if all light from the instrument is screened off and limited to the eye under examination, by a heavy black conical curtain. Light is then admitted to the room until the movements of the consensual pupil can be followed, but without the use of the curtain the consensual pupillary reaction can also be observed objectively with the monocular pupillometer or subjectively with the entopic pupillometer previously described.

The rate of movement of the shutter has considerable effect on the resulting pupillary reaction. This holds true for the normal eye as well as for the hemianoptic eye. In general, on the normal eye if this change is made slowly from one light to the other no reaction may be noted if the accommodative and psychic reactions are not active. These latter reactions are very noticeable the first time a young person sits down to the instrument and simply fixes attention on the central point. If now the pupil is carefully observed with no change in light distribution one often notices in the course of the first minute or so decided variations in the size of the pupil. A noise or a spoken word may cause a distraction of attention or relaxation of accommodation with corresponding exaggeration of the normal hippus that may be noted for a time in absolute silence. These changes become reduced to a minimum as the patient becomes more and more at ease. In older persons whose accommodative reflexes are no longer active these reactions are much less noticeable if present at all. If a distant fixation point were observed through the hollow axle the condition would doubtless be better if it were not for the liability of the test-lights near at hand to stimulate accommodative reactions as they flash into view.

When these reactions are quiescent there may be no pupillary reaction if the lights are slowly changed, but if the change is suddenly made, we notice a quick pupillary contraction followed by a somewhat slower

dilatation to the former size. This may be repeated on the return change if the interval is two or three seconds or more. As the interval is decreased to the neighborhood of one second or less the pupillary contraction and dilatation becomes less until the interval is of such length that the pupillary reaction apparently does not have time to take place, either on account of the time required for transit of the reflex arc or for light adaptation phenomena. While it might be due to a combination of the two the interval is such as to favor light adaptation as an explanation. Symmetry of distribution on both sides of the macula is not necessary. The same thing happens if the lights are turned into the vertical position and a point a short distance out on the horizontal line through the center is taken as an eccentric fixation point. These reactions obtained on the normal eye are the same from either light when the instrument has been adjusted.⁴ This same reaction may be elicited when the two lights are placed in the seeing field of a hemianoptic eye. But in any case, if the eye is allowed to fix a very short distance—a centimeter or less toward either light, for instance—so that asymmetry enters, a difference in pupillary reaction is noticeable.

In examining hemianopic cases the most satisfactory interval of alternation seems to be that which gives the maximum noticeable pupillary movement and seems to be about the same interval (2 or 3 seconds) as that at which the pupillary bounce is most active in the normal eye. The rate of change from one light to another is made as rapidly as possible for the same reason. In some cases in which the hemiopic pupillary reaction is marked, however, it is difficult to mask it with any kind of a shutter movement. Again, when the reaction is not marked, blinding the macula may be resorted to as a means of intercepting the reaction. A piece of heavy black paper having a circular hole an inch or two in diameter is held over one of the light areas and the patient told to look steadily at the center of this spot of light until looking at the center of the instrument fixation can still be maintained in spite of the blinding.

In order to get an idea of the magnitude of a hemiopic pupillary reaction, aside from measuring the pupillary sizes, two methods were used which gave relative results: first, the amount of resistance necessary to cut one light down to the point at which the reaction was the same from one dim light and one bright light. With the second method, the size of the areas was cut down until the consensual reaction could not be made out with the pupillometer on the other eye with any degree of certainty.

In addition to the use of the shutter with the lights in fixed position one light may be exposed and the whole drum rotated so that the light may pass back and forth from blind to seeing field at constant distance from the point of fixation performing concentric rotation tests, as was mentioned in the last paper. Concentric rotation of one light entirely in the seeing field, however, may give a psychic as well as light adaptation contraction of the pupil; so that this movement must be repeated several times with patients in order to reduce the psychic element as much as possible by thorough familiarization with the procedure.

4. In all cases with eccentric fixation, the shutter movement must be as rapid as possible, for, although the total areas in the mid-position of the shutter are symmetrical, there are two periods of asymmetry during the change before and after the mid-position, but these give stimuli in opposite directions so that the total effect balances well with rapid motion.

Cases with relative central scotomata and vision in the neighborhood of 20/200 can be assisted in fixation by sticking a white paper ring symmetrically around the fixation point. With this aid almost all cases can make out the center. At all events, if there is any tendency to look to one side of the center, it is of such direction as to reduce and not to increase a hemiopic pupillary reaction.

Fourteen cases of both anterior and posterior lesions were carefully studied. Their histories, examination and field charts are given in full in the transactions of the section and in the author's reprints, but cannot be given here on account of space limitations. The results of this study may be here summarized as follows:

SUMMARY

From a study of these cases it would appear that the idea of using relatively strong symmetrical illumination has not been an unfruitful method of examination for the hemiopic pupillary reaction. In fact, it has been rather disappointingly fruitful from a standpoint of clinical diagnosis, since apparently a very similar type of reaction has been found in cases of both anterior and posterior lesions.

In the most characteristic form of the reaction, there is, with central fixation on the rotary shutter, no pupillary bounce whatever, as light is changed from the seeing to the blind field, with any rate or interval of shutter movement. The pupil simply dilates slowly in the course of two or three seconds, being somewhat more suggestive of a pupil being released from the effects of light adaptation, than of an ordinary pupillary dilatation as usually seen in a light reaction test. On changing back to the seeing field there are two kinds of reaction according to the rate of shutter movement. If the change is slow so that light adaptation may have time to take place to a certain extent, the pupil will slowly contract to a certain size. If, however, the shutter movement is very rapid, the pupil contracts with a sudden jerk to a size smaller than with slow movement, and it dilates as light adaptation comes on, to a size about the same as that with the slow shutter movement. This effect of light adaptation varies with the strength of illumination used, being much more marked with the strong illumination used in direct examination than with the weaker illuminations which may be used in consensual examinations.

In addition to this characteristic type of reaction there are those cases in which there is only a slight pupillary bounce when the light changes to the seeing field, but the pupil is noticeably larger with the light in the blind field than when in the seeing field. Finally, as the reaction becomes equivocal, it is noted that without distinct difference in pupillary size at rest, there is a more marked pupillary bounce on one side than on the other.

These reactions in their various stages have been found in anterior lesions as well as in posterior lesions. Indeed, one of the most striking examples was in a posterior case. The phenomenon has been found in rather early stages of incomplete hemianopsia of both bitemporal and homonymous types. It has been found in tract and chiasmal lesions both with and without relative central scotomata.

The topical diagnosis in the cases presented is without question in the anterior group of chiasmal and tract lesions. In the group of posterior cases the diagnosis is almost as certain, though without necropsy

it would not be possible to say absolutely that there was no involvement of the pupillary tract, or of the primary ganglion centers. In addition to this rather slight ray of hope, there is the possibility in some of the cases that secondary degeneration may have affected the pupillomotor tract as has been suggested by Rothman. In this connection it would be extremely interesting to follow for from six to eighteen months the pupillary reactions in a very early case of hemianopsia due to capsular apoplexy.

Previously we have been contending largely with the problem of dispersion light, but now, having disposed of that problem more or less satisfactorily, we are evidently confronted by a still more serious complication in the retinal properties of light and dark adaptation. One can blind one half of the retina by looking at the edge of a large bright surface and obtain a difference in pupillary reaction in the normal eye with the rotary shutter. Indeed, the action of the normal eye with direct test on the rotary shutter shows the complication of light adaptation. In complete homonymous cases of whatever origin, Cushing has long noted a large pupil in the eye having lost the temporal field, that is, having lost the greater area of active retina. I have seen this phenomenon several times and three such cases are given in this report. Two of them are posterior lesions. This pupillary status appears too constantly for a sympathetic phenomenon and it cannot be explained by assuming all the pupillomotor activity to be resident in a small macular area, nor does it agree with the idea that the reflex pupillary arc is still intact on the blind side in posterior lesions, even if it were known that the pupillomotoric area were quite large and extended farther on the nasal retina. It may be more easily understood when we consider the light and dark adaptive effect of the two unequal retinal areas on their respective pupils.

From the examination of these cases it would appear that the blind retina has, to say the least, either lost or decreased in light and dark adaptive effects on the pupil. If light and dark adaptive pupillary reactions exist merely as a regulating mechanism, and involve the presence of retinal pupillomotor activity, then we are forced to the conclusion that the retina must either be weakly pupillomotoric to a considerable distance from the macula (30 to 40 degrees), or it is pupillomotoric in a small central area which is sufficiently active, when split, to give a difference in reaction to that distance by asymmetry. In either case, the pupillomotoric activity must fail in the blind retina in order to give the results obtained in these examinations. This has occurred, apparently, in posterior cases against rule (obtained from certain rare cases of subjective blindness from posterior lesions with retained pupillary reactions) that hemianoptic posterior lesions do not disturb the pupillomotoric activity of the blind retina. Possibly the rarity of these cases offers an explanation, that is, that the percentage of cases in which the hemiopic retina is left intact pupillomotorically is no greater than in cases of subjective blindness from posterior lesions, where pupillary reaction is retained. However that may be; it seems reasonably certain that the light adaptive properties are sufficiently damaged in posterior cases of hemianopsia to give a pupillary reaction closely simulating the hemiopic reaction of the pupillary reaction of anterior cases.

Aside from these difficulties, the possible complication of psychic reactions must also be considered. The concentric movement reflex which I have previously mentioned, and could demonstrate in many of these cases, is doubtless simply a light adaptation phenomenon from which the psychic element may be worn away by repetition. The precautions taken before proceeding to the examination aid considerably in eliminating psychic reactions. But the consistency with which the hemiopic pupillary reaction occurs and may be repeated, argues much against psychic complications of any importance. With good cases which could stand the strain of fixation for a considerable period, I have demonstrated the reaction to chiefs and colleagues time after time, as long as they cared to look at it, and none had difficulty in making it out with the unaided eye.

Indeed, in the most marked cases the reactions are so striking that with rough methods one would expect to find a semblance of the phenomenon, and such has been found to be the case. With a pocket flash-light or an electric ophthalmoscope sufficiently strong to give a good view of the pupil, one can get a distinct though not a marked difference in pupillary reaction whenever, on repeated trials, the light is flashed from roughly symmetrical positions on each side of the fixation point. If two flash-lights are held in symmetrical positions and flashed alternately, the reaction is still better but never as marked, or as constant as with the rotary shutter. The fact that the reaction can be detected in marked cases by rough methods both in the anterior and in the posterior cases has an interesting significance in considering the great variety of results reported by observers using these methods.

If the retina has a low grade of pupillomotoric activity or a combination of light adaptive and pupillomotoric properties to some distance from the macula, as my results seem to show, how may the work of Hess be explained? Hess threw a small light on his own optic disk and obtained no reaction by the entopic method when he moved the light above or below concentric with the macula, on to the seeing retina. In fact, sometimes he obtained a better reaction when he passed from the retina on to the bright blind spot because of more reflected light. It is obvious that if the retina about the blind spot had a pupillomotor sensitiveness practically equal to the stimulation of the macula by reflection from the blind spot itself, then the results of Hess could be obtained in the same manner but for an entirely different reason than he supposed, namely, that the peripheral retina had no pupillomotoric activity. Accordingly the size, shape and illumination of the equal areas of the rotary shutter were designed to get the maximum effect from as large an area of retina as possible, and still keep the dispersion light reaching the macular region constant. With this instrument the reflection from the blind spot simply balances its lack of pupillomotor activity, so that its asymmetrical location apparently has no effect.

Altogether from a careful study of the cases reported herein, apparently many conclusions may be drawn, of which the following would appear particularly justifiable.

CONCLUSIONS

1. A weak hemiopic pupillary reaction may be masked by the pupillometer light when observed consensually.

2. Light and dark adaptive phenomena, in addition to dispersion light, seriously complicate the hemiopic pupillary reaction.

3. The hemiopic pupillary reaction is definitely present in anterior lesions, when examined by the rotary shutter method.

4. The hemiopic pupillary reaction is also present in cases having every clinical evidence of being purely posterior cases, although necropsy examination is necessary to prove absolutely that there is no involvement of the optic tract or primary ganglion centers.

5. Although it may be concluded from the examination of these cases that the peripheral retina does possess a weak pupillomotor sensitiveness, there is no evidence that the hemiopic pupillary reaction has any topical diagnostic value.

I am deeply indebted to Prof. Harvey Cushing not only for kindly facilitating this investigation but also for generously allowing me the privilege of presenting this particular phase of his cases.

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ABSTRACT OF DISCUSSION

DR. WALTER B. LANCASTER, Boston: It seems to me that our views of the anatomy and physiology of the pupil reflex paths will have to be revised if these preliminary reports prove to obtain in case of further investigation. We hope that by another year Dr. Walker will have examined enough of these cases to establish certainly whether all posterior lesions as well as the anterior show this phenomenon. He has not attempted to theorize concerning what path the reflex follows. It is an important physiologic problem. Another revolutionary idea which seems to follow from Dr. Walker's experiments, is that the periphery of the retina as far at least as 30 degrees, has the pupillomotoric function as well as the central region. Hess would limit the pupillomotoric area to the central 15 degrees only. I think this a good time to say something in appreciation to Dr. Todd's recommendation for research work. It might appear that this piece of research work was in vain, because this symptom is proved to be of no diagnostic value; but the necessary knowledge of the literature and the exhaustive study of the various factors that come into this problem cannot fail to be of decided value in solving other problems the worker is sure to meet in practice. Of course the importance of proving that the Wernicke symptom has no diagnostic value is obvious.

SAFE AND SPEEDY EXTRACTION OF THE IMMATURE CATARACTOUS LENS FOLLOWING PRELIMINARY CAPSULOTOMY*

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The contentions embodied in this thesis are:

1. An ample, properly executed preliminary capsulotomy has, in mature cataracts, many advantages over immediate capsulotomy or capsulectomy.

2. In morgagnian cataract it enables one to make what is difficult otherwise, namely, an efficient opening in the capsule.

3. The extraction of the clear lens in high myopia is feasible by this method, and

* Read before the Section on Ophthalmology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

4. It will render immature cataract operable after a six-hour interval, leading up to a clean extraction.

These contentions are submitted in the foregoing order that their correlated value may be presented and that the subject-title shall receive final and full consideration. It is generally stated by most writers that the lens-capsule is a highly elastic membrane which, on section, curls outward. It is very doubtful if this statement be true; not as to its curling outward, which is thought to be due to another cause, but as to its elasticity. If it were elastic and under tension it would gape only to incisions at right angles to the lines of traction; that a crucial incision should gape would require elastic fibers radially disposed. This is simply a matter of physics. There is nothing to show histologically the presence of elastic tissue in the lens-capsule; on the contrary, it is a homogeneous hyaline structure which does not stain, nor has the most searching microscopic examination shown elastic fibers therein. Neither can the gaping of the capsulotomy wound be explained on the basis of inherent elasticity in the lens fibers themselves. To quote Tscherning, "The contents of the crystalline lens are composed, in the adult, of two parts: the nucleus, which cannot change its form, and the superficial layer which, on the contrary, possesses this faculty to a very high degree; its consistence is very nearly that of a solution of very thick gum." Quoting Hocquard, he continues, "The whole is surrounded by a capsule which is inextensible or very nearly so. In fact, the laws of dynamics and of finely coordinated muscular action elsewhere in the body demand that, for accommodation, the lens capsule shall be inelastic." In an address delivered in the University of Oxford, Sir William Job Collins says:

The lens is truly described as very elastic in the sense of readily tending to resume its original form after the withdrawal of any force that has modified its form or volume. I should not be disposed to allow that the same elasticity is true of its capsule, though this is alleged by most authors. From a study of it in dissection and in operations, I should be more disposed to say, with Bowman, it is "a hard and dense structure and determines the exact outline of the lens." The capsule is composed of albuminoid substance not of elastic tissue and betrays no trace of cellular structure; on laceration it gapes and sometimes curls in a fashion suggesting that it is held taut by the reefing lines that bind it to the ciliary processes. [Italics mine.—H. E. S.]

Underlying the anterior capsule of the lens and forming with it an intimate union is the epithelial layer whose cells by elongation become lens fibers. The well-known reproductive faculty inherent in these cells, and that any epithelial residue left clinging to the capsule may by proliferation produce a secondary membrane, make imperative that as little as possible of this be left in the eye. A close examination of secondary cataracts will disclose a small opening in the capsule, lens matter at the periphery of the pupil and growing out into this new lens fibers in the visual aperture. Incidentally, this is one of the arguments against a capsulectomy. The foregoing, relative to the capsule, is germane to what shall follow when technique is taken up, to the explanation of what changes take place in the interval between capsulotomy and the extraction proper and to the question why, to secure such altered relationship, an ample capsulotomy is necessary. Reference to these will later be made.

A historical review of the operation of primary capsule rupture need not here be made, for Dr. Percy Fridenberg¹ has so exhaustively covered the ground in a paper read before this Section in 1912 that he leaves nothing to be added. I shall, however, avail myself of frequent quotations from this paper to adduce arguments in support of my several contentions.

It is a reasonable assumption that the lens-capsule is more or less adherent to the epithelial layer immediately beneath it; that it is non-elastic; that it is the traction of the reefing lines that causes it to gape when divided, and that, in proportion to the amplitude of such division, it will release itself from the underlying cortex. With no knowledge of the work of earlier investigators I worked out for myself many years ago a method of preliminary capsulotomy which had for its objects a knowledge in advance of the size of the corneal section to be required for an easy exit of the lens and to make certain an ample and sufficient capsulotomy with the maximum of precision and the minimum of risk. At this time the knife-needle of Knapp was being used but, finding with this that the making of the second limb of the crucial incision became next to impossible, because of early loss of aqueous and the obliteration of the anterior chamber, I supplanted it by a miniature scalpel of my own design which obviated this difficulty. A sketch of this is here inserted (Fig. 1).

I have in former papers gone over the matter to follow, but larger experience only makes more certain

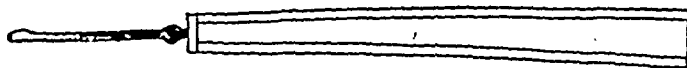


Fig. 1.—The capsulotomy knife.

the truth of the statements therein contained. To restate them: The advantages of a preliminary capsulotomy are many. By the ordinary method some of the difficulties are inherent in the instrument itself, but more and greater ones in the conditions under which it must be used. The straight capsulotome is kept sharp with difficulty. It cuts only when drawn toward the operator; at right angles to this it simply scratches. As soon as the section is made the iris contracts, the lens comes forward and the anterior chamber is abolished. Into this narrow space must be passed a straight instrument between cornea and lens; it is impossible to do this and reach below the anterior pole of the lens without pressing it more or less backward, and at this stage the lens, held only by its suspensory ligament, is mobile and easily dislocated. More than this, the operator in his zeal to make an efficient opening in the capsule is apt to rupture this ligament, and loss of vitreous ensues. There are no means of knowing that the capsulotomy has been inadequately performed until the lens, when pressure is applied to the globe, refuses to come forward. In this event, either the fixation forceps must be reapplied, a difficult and dangerous thing to do on an opened eye, or the cystotome reintroduced without its help, in the trust that the patient will keep still. Narrowing of the pupillary space by the contraction of the iris leaves insufficient room in which to work, and it is a difficult matter not to

1. Fridenberg, Percy: Preparatory Capsulotomy in Extraction of Immature Senile Cataract, THE JOURNAL A. M. A., Sept. 21, 1912, p. 1065.

wound it or entangle it in the tip of the instrument. If the bent cystotome of Knapp is used, these difficulties are enhanced, and not only are there greater obstacles to removing cortical fragments, but a periphereal capsulotomy leaves two thicknesses of capsule in the pupillary space and more often a secondary operation is required. Should blood enter the anterior chamber, the difficulties mentioned before are further increased. None of these difficulties accompanies a preliminary capsulotomy as described in this paper: 1. The knife can be made superlatively sharp, and efficiently cuts the capsule in both directions. 2. Only through the grossest carelessness can the suspensory ligament be ruptured or the lens dislocated, for this is held firmly in place by the vitreous behind and the aqueous in front. 3. Ample space is given through the dilated pupil, and the point of the knife may be kept fully in view during the division of the capsule, and, furthermore, the operator has the satisfaction of knowing that this is adequately performed. 4. The iris cannot be wounded or entangled in the instrument, and there can be no bleeding to obscure the field of operation. In brief, it simplifies and makes certain a step in the operation which is usually fraught with difficulties and dangers. Also when the corneal section comes to be made the iris does not contract so readily, and there is less interference with the extrusion of the lens. It has the further advantage that one can tell in advance of the section just how large this needs to be. If the cut in the capsule is practically invisible, a large nucleus is present. If semigelatinous matter exudes, it is smaller, and if a milky liquid it is smaller still. It is an extremely difficult, if not impossible, task to estimate, with any degree of accuracy, from ophthalmoscopic examination alone, just what is the condition of cortex and nucleus in a cataractous lens, mature or immature. Preliminary capsulotomy reveals the matter and puts us on our guard in some cases. If gelatinous matter exudes we have a soft cortex and probably adherent lens fibers. This is true even if the opacity extends clear up to the anterior capsule and where we would be led to expect, *a priori*, a clean exit of the lens. With an ordinary capsulotomy this means a mushy extraction and much lens matter left in the eye. Even if no operative accident occurs and a nice clear black pupil is secured, the appearance of the eye at the first dressing tells the lamentable tale. Here comes in the advantage of the six-hour interval before the extraction. The action of the aqueous separates the adherent cortical fibers from the capsule, and a clean extraction follows. It is truly marvelous how little pressure is needed to deliver the lens; often it follows the knife on completion of the section. Several operators have written me that this unexpected result was somewhat embarrassing, but it need not be so if it is anticipated. In operating on a morgagnian cataract by the usual method difficulties arise because, on essaying the capsulotomy, the instant the point of the instrument penetrates the capsule the liquid cortex escapes through the puncture, and before this can be extended to an incision, the sac collapses, recedes from the instrument, no further opening is made and there remains in the eye the nucleus in its capsular envelope with an aperture therein too small to admit of its exit. Nothing safely can be done in the way of a more extensive capsular laceration, as the collapsed sac recedes from the point of the cys-

totome. There is a relaxed zonula, no traction on the capsule, and there remains for further instrumentation only that with the sharp hook or the Daviel spoon. It is not necessary to dwell on the operative difficulties which must then be faced or the dangers to the integrity of the eye. With a preliminary capsulotomy the fluid cortex simply mingles with the aqueous, the sac does not collapse or recede, there is no difficulty in making an ample opening, and at leisure we may observe the size of the nucleus and proportion the extent of the corneal incision for its easy exit. The section may then be made with the angular keratome, and at once if it is so desired. There is no advantage to be gained by waiting in morgagnian cataract, for there is no longer cortex to be dealt with. An operative point is here apropos for such cases and for those in which a primary capsule rupture is to be made instead of the usual capsulotomy. It occasionally happens that sufficient aqueous escapes through the corneal puncture to make the anterior chamber so shallow that section would be difficult. In this event, the tip of the McKeown irrigator is applied to the corneal opening and the anterior chamber filled out with normal salt solution. The operation may then proceed as though this incident had not occurred. It does not need any argument to prove that the smaller the corneal section consistent with an easy exit of the lens, the better are the patient's chances against infection and for an uninterrupted healing of the wound, to say nothing of the larger probability of the surgeon making this in a single plane and with greater facility.

It is conceded that operative difficulties and post-operative dangers attend the removal of a cataractous lens in which there is still much transparent cortex; also, it is certain that a method which would minimize these dangers would be of inestimable value to both surgeon and patient. It is also true that it would be better still if all media could be removed which are opaque or which might become so, provided always that in so doing no greater risks, immediate or remote, are incurred. Given a case in which, from advancing opacity in the lens, there results diminished visual acuity, industrial incapacity and mental distress, several courses are open to us. We may advise, as was formerly the almost universal rule, that the patient wait until complete opacification occurs and the cataract becomes operable. This meant for the sufferer more mental distress, a gradually lessened earning capacity, perhaps even poverty and the loss of all the pleasures of life which are dependent on good vision. To make matters worse, there was the haunting element of uncertainty, for no man could say how long might be the weary waiting, or whether after years of groping in semidarkness, even then operable maturity would result. The second course open would be an extraction after the usual method, with all its attendant dangers, operative and post-operative, and the rather small chance of a final good visual result. The third choice would be artificial induction of operable maturity by Förster's, McKeown's or some other method; the fourth, extraction in the capsule, and the last, safe and speedy extraction by my own method.

It is in the hope that the first shall be last and the last shall be first of these several choices, that this paper is presented for your consideration.

Against the second course the profession is practically united, although it is true that in highly skilled hands, with irrigation to remove cortical debris, with preliminary iridectomy and subsequent needling, a fair proportion of successes may be attained; but no one will deny that the risks are greater, the convalescence more prolonged and the final visual results poorer than would be the case in mature, operable and fully opaque cataract.

The third course is artificial maturation; operations intended for this purpose have not attained success and have fallen into disuse. None of the methods used seem to produce any uniform or decided effect. Puncture of the capsule advised by von Graefe in 1864 and reintroduced by Correnti in 1872 fails for the reason that punctures in the capsule do not gape, and there are formed (if any effect is produced) simply insulae of opacity just beneath them and no separation between capsule and cortex. McKeown injected fluid under the lens-capsule. This procedure, though successful, was difficult and dangerous. Does it not seem more rational to bare the lens of its capsule and let the fluids of the eye itself do this effective work?

The fourth course we might follow is extraction in the capsule: against this much must be said. If it could be done with the same proportion of immediate or ultimate successes or with no greater operative risks, this method would be ideal, for it removes in one step every impediment to the clear passage of light into the eye. Unfortunately, the operative risks are appalling and only in hands especially trained under personal tutelage of its one able exponent are these, even then, brought within reasonable comparison of the time-tried classic methods. Barring operative accidents, the immediate results are brilliant; but there are the later ones to be considered. The updrawn pupil (in spite of the large iridectomy) which is later present in these cases points to a dislocation of the vitreous, and I am credibly informed by surgeons of the highest authority in India that there is a slow degenerative change which takes place in these eyes and ultimately leads to much loss of vision. On theoretical grounds the procedure is harsh and unsurgical. To use force sufficient to rupture the zonula, applied from behind (for the resultant force must come from this direction) even if there results no loss of vitreous, is in my opinion a damaging traumatism and a menace to the future integrity of the eye. I have done successful extractions in the capsule, but they were operative mistakes following an insufficient capsulotomy by the usual method. In skilled hands it might possibly be the operation of choice where there was a deep anterior chamber and a tremulous iris, for here one has a weakened zonula; but as a routine measure or for the occasional operator it has my unqualified disapproval. I have had no experience with the manner of separating the lens from its zonular attachment by any of these four methods, namely, suction, traction, lateral pressure or rotation in the patellar fossa; of these the latter appeals to me as more likely to attain the desired result with a minimum of traumatism.

This reviews other methods of dealing with immature cataracts; in my own the capsule is opened by as large a crucial incision as it is possible to make, done as a preliminary measure six hours before the extraction proper. In my own experience, confirmed

by that of others, this is sufficient to produce almost invariably a complete separation between capsule and cortex, to make operable cataracts in any stage of maturity leading up to a clean extraction and rarely leaving cortex behind. It has long been my conviction that the extraction of the clear lens in high myopia was feasible by this method, but I had no opportunity to test this personally. In six of the cases analyzed later in this paper it was carried out and all were successful. One could put the procedure to no greater test than this, for surely, if it led up to a facile extraction in these cases, it should not fail if the lens is becoming opaque. No originality is claimed for the preliminary capsulotomy, and whatever merit the method may possess lies in the technic, which is original, and the discovery that immature cataracts may be rendered safely operable in a few hours. If the capsule is inelastic and held taut by the insertion into it of the reefing lines of the zonula, it follows that in proportion as the incision into this is nearer the point of insertion of these lines, the greater will be the retraction; and the more nearly this incision approaches in form an equal-armed cross, the more perfectly will the capsule retract from the lens

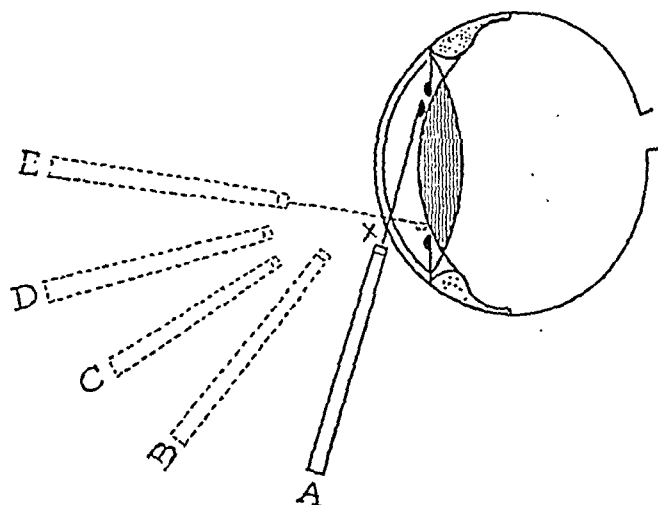


Fig. 2.—Operator standing at patient's head. First plane. Section through right eye on a plane parallel to the long axis of the body. The blade piercing the cornea at *x* is passed down to the lower margin of the dilated pupil and brought successively through positions *B*, *C*, *D* and *E*, thereby effecting a long vertical cut in the lens capsule.

surface, leaving it open to the imbibition of aqueous. Assuming this to be true, it follows that the technic which will insure this large opening is a matter of importance.

It is a matter of difficulty to convey clearly in words such a description of even the simplest operative procedure that he who reads may run—and do it in like fashion. This has been brought home to me by much correspondence from those to whom my previous descriptions were not clear. To this I have appended illustrations which I trust may help to clarify whatever may be lacking in the written word.

In the first place, the shape of the knife is important if one is to make with it the necessary excursions in the anterior chamber and not get into trouble. The blade length should be 2 mm., the belly rounded, the point obtusely ground and the whole acutely sharp from end to end, for heel, belly and point must successively come into use as the cut progresses.

The pupil having been fully dilated by a 2 per cent. solution of homatropin, the proper preparations of

asepsis and cocaineization carried out and the speculum inserted, the operator, if for the right eye, takes his place at the head of the patient. Taking a large grasp with the fixation-forceps over the insertion of the internal rectus, with the little and ring fingers resting on the patient's temple, the capsulotomy knife, held as a pen with the cutting edge of the blade downward, is thrust through the middle of the supertemporal quadrant of the cornea, pushed away from the operator through the anterior chamber until the blade reaches the lowest possible point of the dilated pupil and rests on the vertical meridian of the lens; the handle is now raised until the blade penetrates the capsule; the handle is then made to describe an arc of a circle away from the operator, the blade cutting the capsule along the vertical meridian of the lens. To avoid sinking deeply into the lens or producing a dislocation, the shank is gradually withdrawn in describing the arc until at the termination of the cut

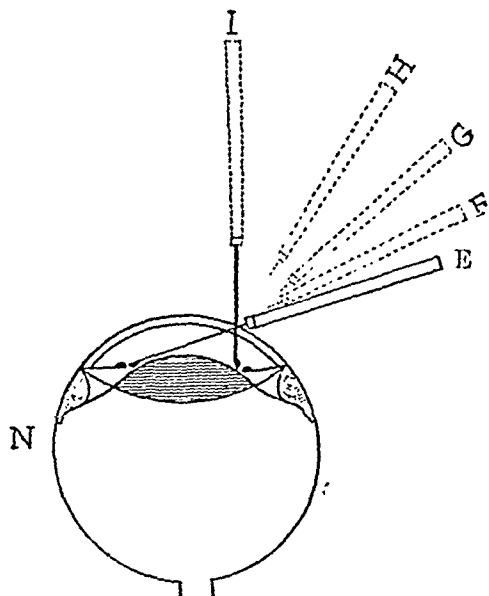


Fig. 3.—Operator standing at patient's head. Second plane. Section through right eye on a plane at right angles to long axis of body. The blade withdrawn from position at *E* (first plane) is passed to the nasal side (*N*) of the dilated pupil and brought successively through positions *F*, *G*, *H* and *I*, thereby effecting a long cut in the lens capsule at right angles to the first incision.

little more than the blade remains within the eye. The point is now released, the handle brought into its original position, the shank reintroduced and the blade carried over to the margin of the pupil nasalward and onto the horizontal meridian of the lens; the handle is now given a quarter turn toward the operator, thus bringing the cutting surface of the blade against the capsule. Again is the handle made to describe the arc of a circle, this time nasalward, the blade being kept on the horizontal meridian of the lens and the shank gradually withdrawn as the cut approaches completion. The blade is then brought into its original plane of entrance (to avoid enlarging the corneal wound) and withdrawn from the eye. If for the left eye, the operator stands at his patient's left, the corneal entrance is in the temporo-inferior quadrant and the first cut in the capsule begins above on the vertical meridian of the lens, ending below. Otherwise, the technic is the same. The speculum is now removed, a drop of physostigmin (eserin) solu-

tion, $1\frac{1}{2}$ grains to the ounce, is dropped into the eye and an antiseptic dressing is applied.

It is evident that on the spherical curve of the lens surface the cut begins with the heel of the blade, is continued with the belly and ends with the point—hence the shape of the blade and the need for cutting sharpness all along its length. That the blade be short is necessary if the proper maneuvers in the anterior chamber are to be made without enlarging the corneal wound, without dislocating the lens, without having loss of aqueous, without cutting too deeply into the lens substance; it is necessary also to success in making the largest possible capsulotomy.

With the ordinary knife-needle, to escape these dangers, only a small crucial capsulotomy is possible. If aqueous is lost while the vertical cut is being made, the transverse one is impossible. If my assumptions of the mechanism of the rapid operability of immature cataracts and the retraction of the capsule be true, then it is essential that the technic here set forth be accurately followed.

Six hours after the capsulotomy the extraction proper is undertaken. I had formerly advised a twenty-four-hour interval, but I fear that this was more from motives of convenience than of necessity. Moreover I could not see that the lens came out any easier in this than in the lesser interval. On two occasions, with the longer waiting, high tension was a complicating factor in the extraction. This has occurred also in the shorter period to other operators, but, while introducing difficulties, has not resulted disastrously, as the extraction has checked the process. Occasionally, some circumcorneal injection was manifest when the dressings were taken off for the second operation. In these cases, to insure proper anesthesia, the cocaine was preceded by a drop of 1:1,000 epinephrin solution. The extraction proper is done after the usual method, but the operator now knows just how large a corneal section is necessary. If there has been no escape of semigelatinous lens matter from the capsular cut, then the section should comprise the upper two-fifths of the cornea, as the nuclei of immature cataracts are usually large.

Each operator may elect whether or not he shall make a conjunctival flap. My own preference is for this and a large one. Here, again, is another advantage in preliminary capsulotomy. The flap turned down over the cornea, when an ordinary capsulotomy is next to be done, obscures the operative field. When this has been done, the disposition of the flap is no embarrassment.

The matter of simple versus combined extraction is too complex to admit of review in this place. My own choice is for the former, provided the iris is mobile and dilatable. The cosmetic results are better, and there is no risk of adhesions between cut iris surfaces and tags of capsular membrane. With preliminary capsulotomy there is practically never cortical debris to be reckoned with, and the risk of iris prolapse is minimized by the immediate use of atropin following the toilet of the wound. There are surgeons, however, who prefer the combined extraction as a routine procedure. There is much to be said in its favor, and for the occasional operator who has not the facilities of special hospitals or trained ophthalmic nursing it is perhaps the safer method. That the contentions embodied in this thesis might carry greater weight than would my own unsupported asser-

tions, letters were sent out to members of this Section, whose replies are tabulated here.

RESULTS OF OPERATIONS ON IMMATURE CATARACTS
FOLLOWING PRELIMINARY CAPSULOTOMY

	No.	Per Cent.
Total number.....	180	..
Of these there were successful.....	164	91
Total failures.....	5	3
Partial failures.....	11	6

There were thirty-nine operators who reported cases; of these several reported only one case each. Taking into account unfamiliarity with a new procedure at the hands of many men, and comparing the statistics of results in fully mature and operable cataracts with the percentages here given, in what is admittedly a more difficult and dangerous operation, it will be seen that this method does not suffer by comparison. An analysis of the causes for partial and total failures would make the comparison still better, for of the total failures one had nothing to do with the operation, and the partial failures were tabulated as such irrespective of the final visual results. Of the five total failures, one was due to intra-ocular hemorrhage some days after a successful extraction, with no ascertainable cause; one was due to vitreous prolapse, the nucleus being left in the eye, which was subsequently lost by plastic iridocyclitis; one was due to plastic iritis; the pupil closed in and two cystotomies later failed to keep it open. For the remaining two no cause was given. Of the partial failures eight were due to lens matter left in the eye; in one case the operator failed in technic only, the final visual result being good. No cause was given in two cases. Final results were good in three cases, and not reported in eight. Of operative accidents only three are reported; in two the lens was dislocated, and in the third partially so. There were twelve cases reported of postoperative complications; six of these were iridic inflammations, six of high tension; but while these introduced an embarrassing feature, none resulted disastrously. The intervals between capsulotomy and the extraction varied between six hours and ten days, the largest number being twenty-four hours.

Against the many advantages of a preliminary capsulotomy, irrespective of the maturative process on the partially opaque lens, I advanced the objection that the operation requires more time and trouble, as the technic of asepsis must twice be gone over. Dr. Fridenberg says, "We cannot, however, dismiss all objections in a single sentence unless we close our eyes to the fact that it is the danger of infection even more than the time and trouble of disinfection in a second operation to which we hesitate to expose our patient and which we or for not risk unless there is something definitely justified." I am not aware of any experience with the manner of action under modern methods, namely, suction, traction, maller than in the or rotation in the patellar fossa; of for in this it was appeals to me as more likely to attract infections at all. result with a minimum of traumatism in a single This reviews other methods of dealing with immature cataracts; in my own the capsulogical procedure, as large a crucial incision as it is possible to make, done as a preliminary measure six hours before a section one extraction proper. In my own experience with capsulotomy

if properly performed, nor is there need of this, for there remains no capsule in the pupillary space. In the circular letter sent out criticism was invited. The most serious objection was that high tension followed. This occurred in 3 per cent. of the operations. In such cases it is better not to use a speculum but to employ Angelucci's fixation. Also, the section should end with extreme gentleness, as the lens will almost invariably come out with its completion. The next objection in point of importance was retention of lens matter at the time of extraction. This occurred in less than 5 per cent. of the cases. This, too, compares favorably with the percentage of the same mishap in apparently fully mature lens extractions. It usually can be successfully met by irrigations with McKeown's instrument, using normal salt solution; failing the accomplishment by this, needling should give better vision. There are cases which will always require this, for, quoting Risley, "In this class of cases there is usually some involvement of the posterior capsule as a sequel to the uveal disease which caused the cataract, and secondary capsulotomies are frequently required."

It should not be forgotten that a cataractous eye is a sick eye and perfect visual results the exception and not the rule. Two well-known surgeons have written me that they could not see that the lens comes out any easier or cleaner with a preliminary capsulotomy than without. If this be true, why the many procedures which have been adopted for the artificial maturation of the opacifying lens? Why have surgeons hesitated to operate on immature cataracts? Or why should this paper have been written at all? Many of my colleagues have been so good as to express their commendation. They say:

"It is a valuable addition to our technic, the best since McKeown gave us the irrigator."

"Approve of it very much and favor it especially after having had some experience with the Indian Smith operation."

"Consider your method, if carefully performed, devoid of danger and superior to other methods of hastening the maturity of unripe cataracts."

"The intracapsular operation is still the thing we most desire, but if the capsule of the lens is to be left within the eye, there is no operation which compares with yours."

"Believe this is one of the best, if not the very best, operation for immature cataracts."

"Have found the procedure very satisfactory."

"A safer operation than extraction in the capsule."

"Think it good practice and expect to use it more."

"Believe it to be superior to Förster's."

"I am much impressed with the great value of your procedure. For immature cataract, especially in subjects under 55 years of age, in conjunction with irrigation of the anterior chamber it appeals to me to be unexcelled."

These opinions, selected from many others equally commendatory, are from men eminent in the profession and known to all of you.

In conclusion, I wish again to emphasize the advantages of a preliminary capsulotomy as against capsulectomy or that immediately preceding the delivery of the lens. When properly performed and an interval of six hours allowed to elapse between this and the extraction proper, a separation between capsule and cortex will result and so make immediately operable cataracts in any state of opacification; and the delivery of the lens, mature or immature, is cleaner and easier than by any other method.

ABSTRACT OF DISCUSSION

DR. S. D. RISLEY, Philadelphia: I have been able to demonstrate to my own satisfaction the signal value of preliminary capsulotomy in the several varieties of immature cataract, but have not employed it, as Dr. Smith suggests, as a preliminary step in the extraction of fully opaque lenses. In the extraction of mature cataract I have not experienced the difficulty and danger he describes in performing capsulotomy after the corneoscleral section has been made. The procedure, however, in lamellar cataract, extraction of the lens in high myopia and the amber-colored and posterior polar or capsular cataracts, has proved valuable. In the opaque, milky lenses of the morgagnian type, I doubt its expediency unless the remaining nucleus is extracted immediately. I have been led to fear the deleterious influence of the contents of the capsule of a fluid cataract on the health of the eye if allowed to escape into the anterior chamber and remain there. The eye is liable to ciliary injection or iridocyclitis with

capsulotomy is important.

To cut deeply into the capsule is the operation. The

perform the cross-section of the capsule, being careful to avoid the nucleus. I have used for this purpose a fine needle described some years ago, a

thin midrib beaten from a piece of wire, which can be made so that the blade is tightly filled with the substance of the lens. When this blade is

used at first only a dark line of illumination to broaden into a capsule which later becomes opaque. This grayness has passed

found it convenient to under-ride the lens in six hours after the preliminary capsulotomy, but have habitually allowed two days to intervene, unless necessity arose for earlier intervention. In my experience, no untoward results have come from this delay provided the anterior cortex of the lens has not been deeply invaded while cutting the capsule.

At my Wills Hospital Clinic I have to contend with a large percentage of complicated cataracts, that is to say, eyes with uveal disease with vitreous infiltration, irises which do not dilate well, engorged anterior ciliary vessels and opacities of the lens, or opacity of the posterior capsule, often spreading to the cortex at the pole of the lens, with or without spicules emanating from the periphery of the lens and projecting along both the anterior and posterior capsules into the pupillary area. In a considerable percentage of these eyes the lens becomes amber-colored, remains more or less transparent and the opacity does not advance. In these cases I have found the preliminary capsulotomy of advantage. I have not been so fortunate as Dr. Smith seems to have been in extracting these lenses without the necessity for secondary operations. I have been compelled in certain cases to resort to secondary capsulotomy to secure a clear pupil. The procedure is of signal advantage in the extraction of the transparent lens in high myopia and in the lamellar cataracts of childhood. I am convinced that in the entire group of cases which I have designated as complicated cataracts, the preliminary capsulotomy affords better results than can usually be obtained by extraction by our more usual methods.

DR. HIRAM WOODS, Baltimore, Md.: I have to relate my experience with three cases of the Homer Smith operation. The first patient was a man with double cataract. He was a railroad man, aged 43, whose central vision was reduced to about 3/200 from nuclear cataracts. He was unable to work. I had read Smith's communication. I obtained his knife, and in my first case did a preliminary capsulotomy on one eye, in the afternoon, Jan. 7, 1913. The capsulotomy

was done with the incisions described by Smith. I did not see the patient again until the next afternoon; but at about 10 a. m. that morning I had a message from the nurse at the hospital that the man had a great deal of pain and nausea. In the afternoon I found T+ with the fingers. It was not measured with the tonometer. I made an immediate extraction of the lens. The appearance of the lens had not been changed, but the iris was distinctly bulging forward. The only complication was a rather profuse hemorrhage with the iridectomy. The patient recovered without further incident. The pupil was entirely clear of any remnants of soft substance, and he obtained 20/20 vision in that eye. Two weeks later, preliminary capsulotomy was done on the other eye at 8 a. m. Early in the afternoon, the cataract was removed with an iridectomy. I followed Smith's directions accurately, allowing six or seven hours between the two operations. There was no reaction and no soft substance. When I last saw the patient, he had normal vision in both eyes. The third case was that of a man aged 40, who had lost one eye from a cataract operation in another city, and I wanted to give him every possible chance. He had an opalescent cataract, V. = 20/200. I did a preliminary iridectomy Jan. 16, 1913, and waited till February 13, and then did a preliminary capsulotomy in the morning, intending to extract the lens in the afternoon. He felt unwell in the afternoon, but the eye was quiet. He grew worse and apparently had an attack of grip. I had to wait nine days, to February 22, before I could remove the cataract. The eye showed no irritation during this time, and when extraction was done, the lens came away readily, leaving a clear pupil. He obtained almost 20/20 vision. These cases bore out Smith's contention that this operation brings away the entire lens. I want to compare these cases with another operated on recently. A woman with an old central choroiditis wanted an immature, nuclear and probably secondary cataract removed. Owing to circumstances, which I could not control, she did not come in time for a preliminary capsulotomy and I extracted the partially clear lens without the preliminary capsulotomy. I had done a preliminary iridectomy two months before. In this case, there was a lot of soft lens substance which had to be removed by irrigation. The patient did well, but had only 20/80 vision from 20/200.

These cases seem to bear out Smith's statement that preliminary capsulotomy is efficacious in separating soft cortical substance from the capsule, and making it adhere to the lens. In the first three cases I had no cortical matter to deal with. In the case in which the preliminary capsulotomy was not done, there was considerable soft lens substance.

DR. ALLEN GREENWOOD, Boston: I have operated in two of these cases of high myopia with nuclear cataract, and have made, instead of the two punctures, a V-shaped incision with a knife recommended two years ago by Dr. Fridenberg. This can be done without the loss of aqueous, and I can testify to the ease with which the lens can be pressed out after this preliminary capsulotomy. It is my custom to do the preliminary capsulotomy late in the afternoon of one day and to operate the next morning, having an irrigating apparatus ready to use if necessary.

DR. W. E. LAMBERT, New York: I have had some experience with the Smith method in cases of high myopia. It is my custom, however, in such cases, to do the ordinary dissection, especially in young people. I operated on a woman over 50, with high myopia and immature cataracts, the nuclei apparently rather large. I did a preliminary iridectomy in both eyes and felt justified subsequently in doing a simple extraction in one eye. The result was most satisfactory; but there was so much soft matter remaining that I did a preliminary capsulotomy on the second eye. A peculiar and alarming complication arose. I have never extracted the lens as soon as six hours after the capsulotomy, but usually twenty-four hours—frequently, in cases of myopia, much later. In the case referred to, forty-eight hours elapsed and the lens being somewhat swollen, I had to make the extraction; a smear, he

showed a mild infection, and Dr. Dixon, our pathologist, advised waiting. I did wait fortunately, and the next morning the patient had an acute mucopurulent conjunctivitis, tension plus, and circumcorneal injection. I used a 1/20 grain of silver nitrate irrigation. At the end of three days the acute catarrhal conjunctivitis had subsided and I extracted the lens. It came out nicely, with less soft lens matter than in the first case. The patient made an excellent recovery. I think the procedure is useful in high myopia, especially in older people.

DR. M. FEINGOLD, New Orleans: I have performed Dr. Smith's operation in about twelve cases, but I had to deviate from the practice advocated by Dr. Smith as to the time of the second operation, for the reason given by Dr. Risley. Another, a theoretical, reason occurred to me for which we should delay the second operation. We all know that bandaging a comparatively sterile eye after it has been handled with any kind of cleaning material such as soap, mercuric chloride or otherwise, may bring about a low-grade conjunctivitis, which, when the wound is closed, is in no way endangering the good result; but should we attempt to operate on the eye during this conjunctivitis, if in any degree purulent, we might run the risk of producing an infection. For that reason I concluded it would be better to make the incision, wait until removal of the bandages, and then to allow the eye to become normal again and in forty-eight hours or later perform the second operation, provided no important indication for delay has occurred. It is interesting that Dr. Lambert's case brought out one of the possibilities which I had determined theoretically. Another reason for delay which occurred to me is that we might make the primary incision with an instrument that has a little thicker shaft and when we attempt the second operation six hours later, we might get emptying of the anterior chamber before we have entered with the knife, should the patient behave badly, squeeze the eye, etc. For these reasons, especially as infection is so important I thought it worth while to delay the secondary operation, and I have delayed as long as ten days, with no untoward symptoms. As to the point of secondary operations, three or four weeks ago I was compelled to perform a secondary dissection following one of these operations.

DR. OTIS ORENDORFF, Canon City, Colo.: Nowadays we seldom have infection after cataract extraction, and those who do the preliminary iridectomy will have few cases of infection, so that it can be almost disregarded. Delaying this operation for several days or weeks or months is a disadvantage, for the patient has to go into the hospital twice, which a good many of them will not like to do; and it is not necessary. I have not used Dr. Smith's knife, but the knife Dr. Risley speaks of. I have tried the operation for morgagnian cataract and am not pleased with it, because the contents of the lens are let out into the aqueous instead of the aqueous into the lens capsule, which is the object of the operation. Formerly, with a patient in middle life with a diagnosis and prognosis of immature cataract, the inevitable waiting, the industrial incapacity and mental distress was much like a sentence of death and victims became depressed, run down and assumed serious physical as well as mental condition. This is now entirely changed, for preliminary capsulotomy brings these cases into the category of the most hopeful of the deeper diseases of the eye. There is not only the hope of good vision, but it is not now necessary to wait for the ripening of the cataract. I have had a few cases attended with more or less success. One especially shows the typical mental aspect in many of these cases and the encouraging result. A railroad mechanic, healthy except for extreme nervousness, who had lost one eye by accident in infancy, had a slowly advancing cataract in the other eye which compelled him to abandon his former more lucrative positions. Oculists whom he consulted advised further delay, but he declared this meant insanity or worse. He could still count fingers at 10 feet and a fairly good view of the fundus could be had. The patient refused to wait further. A crucial incision in the capsule was made with the needle

knife and to my astonishment the lens followed the knife out of the wound. One year later vision was 15/10 plus with 9 plus 2, axis 165. He has been on the pay-roll ten months, a contented man. My records show a number of slowly developing cataracts in comparatively young people who have only one eye, and a preponderance of cataracts occur in one-eyed people, due probably to the excessive use of the remaining eye. Persons with immature cataract compose a large percentage of our patients, and if this operation will afford them early relief it behooves us to recognize it.

DR. JOHN GREEN, JR., St. Louis: That six hours may be an insufficient interval between preliminary capsulotomy and extraction to permit of efficient separation of the capsule is indicated by a recent experience. My patient, aged 65, had immature nuclear cataract. A capsulotomy according to Smith was done at 8 a. m. There was moderate gaping of the cut, with extrusion of a little gelatinous cortex. Eight hours later combined extraction was made. A large nucleus accompanied by much sticky cortex was with difficulty extracted. Immediately following the delivery of the lens vitreous appeared in the wound, so that contemplated irrigation had to be abandoned. The ultimate result was fair—vision 6/10.

DR. W. M. SWEET, Philadelphia: Although I have not performed many preliminary capsulotomies according to Dr. Smith's method, I have had an opportunity of noting the effect of the operation in the twenty-five or thirty cases operated on by Dr. H. F. Hansell. In the earlier cases either the Knapp or Ziegler knife-needle was employed, but later the special knife devised by Dr. Smith was used, made by Tieman. Owing to the somewhat faulty construction of the knife, the blade being much wider than the circumference of the shank, the aqueous escaped after the first incision in the capsule, so that the second cut was made with difficulty. In all the cases the extraction was done twenty-four hours following the capsulotomy, as it was difficult in the hospital cases to arrange to operate six hours later. I was especially impressed in these cases by the different behavior of the cataracts even when the incision in the capsule appeared to be of the same extent. In the majority there was only moderate increase in the opacity and in the swelling of the lens. In a few there was a decided reaction. Even with the preliminary capsulotomy, many of the cases showed retained cortex in the pupillary space that required the use of the irrigator. Whether we operate in unripe cataract by the Homer Smith procedure or by preliminary iridectomy, I believe that many cases of retained cortex in the pupil are the result of an inadequate incision at the time of the final extraction, the angles of an incision wiping off portions of the cortex and leaving it in the anterior chamber.

DR. F. C. TODD, Minneapolis: The operation has been generally accepted as a distinct advance in this class of cases. I cannot agree with Dr. Feingold that we should wait some days before proceeding with the extraction. It seems to me it is better to operate within a few hours than to wait for reaction. One point was brought to my attention by Colonel Elliot, who was enthusiastic as to the operation—the wisdom of operating in the morning instead of the afternoon as suggested by Dr. Smith, in that glaucoma might occur within the first few hours and there would be opportunity for extraction early during the daytime. I have, therefore, in more recent cases, operated in the morning and done the extraction in the afternoon. There is one more advantage in this operation that has not been mentioned. It is evident that one cannot always make a diagnosis of an immature cataract. I am sure others make this mistake. I have extracted not a few lenses that were entirely hard, that has been postponed because of supposed immaturity by other oculists. This operation enables us to diagnose the consistency of the lens, it is an "exploratory incision," and if we find we have made a mistake and the lens is hard we can extract at once after making the capsulotomy.

DR. M. BLACK, Denver: Is the knife made right?

DR. HOMER SMITH, Norwich, N. Y.: It is a great pity that those who make the instrument do not have to use it. The

blade should be beaten from the shank. The belly of the blade should be acutely sharp so that each portion will come in contact with the incision. If not acutely sharp you will lose vitreous. Each knife should be tested out on a drum to see that the cutting edge of the blade is sharp clear up to the point. On account of lack of this some accidents have occurred. Tiemann makes the best knife. Dr. Risley takes up the point of preliminary capsulotomy as a routine measure in acute cataracts. It is universally adopted in England. In my paper the matter of the immediate extraction of morgagnian cataract is taken up, and I do not allow the six-hour interval because there is no cortex to deal with. If there is loss of aqueous at the time of the capsulotomy there is no trouble following, because the anterior chamber can be refilled by an irrigator with normal salt solution and you can go on with the extraction immediately without further waiting. In all the cases reported, 180, there were no infections whatever, so that matter is a negligible factor. But high tension is another matter. In a number of cases there will be high tension, and the longer the interval between the preliminary capsulotomy and the extraction proper the greater the risks of high tension. The high tension cases require some variation in the technic. A speculum should not be used, but fixation. If the anterior chamber is shallow, then you have three operative courses: The incision can be begun by and continued with the scissors curved on the flat. If the anterior chamber is almost completely obliterated, the section can be made from the outside with a broad-bladed scalpel through the sclerocorneal junction. I have seen that done at Moorfields repeatedly. The scissors may be applied in that case also. In all high tension cases the section can be made full size in the ordinary way, but should be completed with the utmost gentleness on account of the risk to the vitreous. I said in my paper that secondary operations are rare; I did not say they are never required. There is a small percentage of cases in which it does not work.

ACTIVE IMMUNIZATION IN DIPHTHERIA AND TREATMENT BY TOXIN- ANTITOXIN*

WILLIAM H. PARK, M.D.

AND

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Assisted by

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The property of toxin-antitoxin mixtures to produce immunity in animals has long been known. One of us (W. H. P.) published a series of successful results in 1903. Smith suggested the attempt to immunize children, but no one undertook it until 1912, when von Behring made the attempt.

In May, 1913, Behring published the results obtained in human beings. The combined substances were either neutral or slightly toxic to the guinea-pig. Individuals were injected with small doses (from 1/20 to 1/10 c.c.) which were repeated in from seven to ten days. The first injections were made subcutaneously or intramuscularly, while later the intracutaneous administration was favored, since the more distinct local reaction was believed to induce a greater efficiency of vaccination.

The results as reported from different observers have not been uniform and as a rule are not distinctly stated. Hahn reports antitoxin production in thirty-

six out of forty treated; as we shall see later, the fact that twenty-five of the forty patients had natural antitoxin already present modifies greatly the favorable nature of this result. Failure to respond was at first attributed to a lowered general condition but now we realize that it was because the susceptibility to the immunizing response to vaccine varies. It seems greatest in young adults. Zangmeister reports the interesting fact that the new-born are nearly a hundred times less susceptible to vaccine than adults. Kleinschmidt and Viereck report the active immunization of twenty-seven cases, but give no definite data. They advise combined active and passive immunization in persons exposed to diphtheria and also suggest the use of the Schick reaction in determining antitoxin content of persons after vaccination. Kissling reports results at Hamburg-Eppendorf in the immunization of 310 patients who were exposed to infection. In the 111 who were injected twice, no diphtheria developed. In the 109 cases injected once, 8 patients developed clinical diphtheria. During an epidemic of diphtheria, Hahn and Sommer vaccinated part of the inhabitants of several villages: of 633 patients considered fully immunized only two developed mild diphtheria, but 10 of the group developed it during the first ten days. The disease continued to spread to some extent among those not vaccinated. Bauer finds that the persistence of the bacilli in carriers is not shortened by active immunization. He believes that not only all patients with antitoxin, but also those without natural antitoxin can be immunized, if sufficient doses and amounts of vaccine are injected.

The interval between the injections of vaccine and development of antitoxin varies in different cases. According to Hahn it is usually not less than three weeks. Kleinschmidt and Viereck found it shorter—even eight days. Patients with natural antitoxin usually show early and considerable antitoxin production. They also generally show a somewhat greater local susceptibility to vaccines. This according to von Behring is due to sensitization from previous infections with the Klebs-Loeffler bacillus.

According to von Behring, the higher temperature of fever will destroy antitoxin at an increased rate so that an amount of antitoxin, which generally protects, fails to do so in measles and scarlet fever. Schick and Karasawa find, however, that no change in antitoxin content is caused by measles. Von Behring considers that 0.01 unit per cubic centimeter is sufficient to protect healthy persons. Much less than this probably suffices except under unusual conditions, as in scarlet fever.

PERSONAL EXPERIENCE

During the past twelve months the attempt has been made to immunize actively against diphtheria the patients in the scarlet fever wards of the Willard Parker Hospital. Owing to the large number of diphtheria-carriers admitted, the conditions in this hospital during the winter were such that on the average about one-quarter of the inmates were diphtheria-carriers.

For this purpose mixtures of diphtheria toxin and antitoxin were prepared, either slightly antitoxic, neutral or slightly toxic to the guinea-pig. A strong diphtheria toxin was used, where the minimum lethal dose was 0.0023 c.c. and L+ dose 0.27 c.c. The mixtures represented B 50 per cent., A 66 per cent., G 66 per cent., F 80 per cent. and E 90 per cent. L+ toxin to each unit of antitoxin. The L+ dose of toxin is

* From the Research Laboratory of the Department of Health.

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

the amount which, when mixed with 1 unit of antitoxin and injected into a 250-gm. guinea-pig, will cause its death at the end of four days. One c.c. of Mixture E caused when injected into a guinea-pig at first a slight local induration and then in about twenty-days paralysis.

The injections were made subcutaneously or intramuscularly in doses of from 0.25 to 1 c.c. of undiluted vaccine; a few of the non-immune persons received as high as from 3 to 5 c.c. at each injection. The dose was repeated two or three times at intervals of from three to seven days. The injections were made posteriorly in the intrascapular region, in some over the insertion of the deltoid.

The local reactions consisted as a rule of varying degrees of redness, induration, pain and tenderness; in part they seemed to depend on the size of the dose and in part on the individual susceptibility. Persons with natural antitoxin gave somewhat more frequently the stronger local reactions. The constitutional symptoms were as a rule rather mild; occasional temperature reactions of from 1 to 3 degrees were noted after larger doses of Mixture E.

The results of the active immunization were controlled by determining the antitoxin content before the injection; again three weeks and more after the injections similar examinations were made. The antitoxin content of the serums was estimated by Römer's intracutaneous method on the guinea-pig. As it was not possible to detect less than 1.160 unit in 1 c.c. of serum, anything less than that was considered as absence of antitoxin, although naturally some serums not showing this amount may have had a slight trace.

A group of 68 patients was injected with the various vaccines; of these, 44 had, before the injections, sufficient natural antitoxin to protect them against diphtheria. They all showed a decided production of antitoxin in a relatively short time (in some as early as seven days). The remaining 24 patients had no appreciable antitoxin before the injections; of these, 6 gave rise to distinct antitoxin production while 18 failed to respond.

Five patients of the 18 which did not respond developed slight or moderate clinical diphtheria two weeks or more after the first injection. Four had tonsillar exudates and one nasal diphtheria with visible membrane in the anterior nares. Cultures were positive, and the isolated Klebs-Loeffler organizations virulent.

We thus found that persons with natural antitoxin gave a ready response to active immunization, while those with no appreciable natural antitoxin failed to do so in a considerable proportion of cases. A larger group of susceptible patients was, therefore, selected to determine these results in a greater number of cases. For this purpose the intracutaneous reaction of Schick with diluted diphtheria toxin was used. This reaction depends on the local irritant action of toxin in the absence of antitoxin. A dilution of diphtheria toxin is made of such strength that 0.1 c.c. contains 1/50 minimum lethal dose for the guinea-pig. This amount is injected intracutaneously on the flexor surface of the forearm. A positive reaction appears in from twenty-four to forty-eight hours, and is characterized by a circumscribed area of redness and slight infiltration, which remains for from seven to ten days. After fading, a brownish pigmented area is left for days and weeks which in beginning generally shows superficial scaling. According to Schick, a positive reaction indicates that there is less than 1/30 unit of

antitoxin in 1 c.c. of blood. The majority have none at all. Such persons he considers susceptible to diphtheria. Our estimations agree with his conclusion.

The Schick reaction was again employed three weeks and more after the vaccination to indicate clinically whether or not the patients had responded to the immunization. In many, bleedings were taken and tested in addition before and after the injections.

Ninety persons without appreciable antitoxin were thus selected who received full immunizing doses of Vaccines E and F; of these only twenty, or 22 per cent., gave rise to a decided production of antitoxin (1/20 up to 10 units per cubic centimeter). Among the remaining seventy patients a considerable number were found in whom the Schick reaction was fainter, but not obliterated when the tests were made four or five weeks after the injections; the antitoxin produced, however, was too small in amount to be detected in the animal test. Seventeen of the seventy patients who failed to respond developed clinical diphtheria twelve days or more after the first injection of the vaccine; those who showed symptoms before twelve days were not included in the group. Twelve patients had purulent nasal discharges sometimes tinged with blood, four tonsillar exudate, and one laryngeal diphtheria. The cultures were positive, and the isolated organisms virulent.

We note that active immunization in this group of susceptible persons gave rise to decided antitoxin production in 22 per cent. of cases; the interval between vaccination and development of immunity was generally long, as a rule not less than two weeks. Under conditions of exposure about 20 per cent. of those who failed to respond have developed clinical diphtheria.

SUMMARY

Active immunization produced a very decided increase of antitoxin in a relatively short time in all persons who had natural antitoxin. These, however, were immune to diphtheria before the injections were made.

In a series of 700 scarlet fever patients of varying ages tested by us for natural immunity by the Schick reaction, 400 gave a negative reaction. Fifty-seven per cent. were, therefore, naturally protected and needed neither active nor passive immunization. Less than one quarter of the remaining 43 per cent., which were probably susceptible to diphtheria, reacted to active immunization with mixtures of diphtheria toxin and antitoxin to a degree sufficient to immunize them surely. A larger percentage developed a trace of antitoxin which was possibly enough to give a slight protection.

CONCLUSIONS

Those who are definitely exposed to infection should be passively immunized even if the toxin-antitoxin injections have been given.

The use of the Schick test will eliminate the necessity of immunizing about two-thirds of those subjected to exposure, as judging from a year's experience, those not reacting are immune.

Those found to be naturally immune probably continue immune for a considerable period of time, possibly indefinitely.

Active immunization is indicated when there is no immediate danger of infection and when it is desirable to lessen the number of susceptible persons. It is too early to decide whether active immunization should be

attempted on a large scale. The lack of a sufficient response of at least 50 per cent. of those susceptible to diphtheria and the fact that the immunity lasts for but one or two years are drawbacks that will probably limit to some degree its usefulness.

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THE USE OF ANTITOXIN IN DIPHTHERIA *

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Conclusions as to the use of any remedy in a disease must be based, in the final analysis, on practical experience. Theory may aid us in finding the remedy and may guide us in its use, but our final judgment must be based on results alone.

Diphtheria antitoxin has been abundantly proved to be a specific for diphtheria, and a cure when used in correct doses at the proper time. With an agent at our service, known for such a length of time, of such acknowledged usefulness, and of such direct and specific action, it is surprising that there should exist even that small percentage of failures which we must constantly face. It is true that the circumstances of general practice and the possibilities of error in diagnosis offer limitations to the immediate and proper use of the serum which make the attainment of ideal results out of the question. Nevertheless, it must be apparent that it should be possible still further to reduce our mortality, reduce it to a much smaller figure than it is at present. If, therefore this result is to be achieved, we must accomplish it by a change in the method of our use of the specific for the disease—general hygiene of the patient and medication being watched always in addition.

This paper is based on personal observation of over ten thousand cases of diphtheria at the Philadelphia Hospital for Contagious Diseases. This series of cases has given me ample opportunity to observe the action of various doses of antitoxin.

The use of antitoxin in diphtheria is so eminently successful because diphtheria is primarily a local disease, exerting its harmful effects through the formation of a toxin by the organism causing the diphtheritic process. This toxin is quickly spread throughout the entire body and attacks early the nervous system, heart and kidneys, all structures of vital importance. The resistance of the body to this toxin is by the formation within of an antitoxin, and this protective action we aid by the introduction from without of an antitoxic serum.

The term "antitoxin" as used in this paper refers to the serum containing antitoxin—the diphtheria antitoxin of the United States Pharmacopeia, officially defined as "blood-serum from horses immunized against diphtheria poison." There is also in use a method for determining the amount of antitoxin in the immune serum. This method, by which the content is expressed in certain definite units, enables us to measure comparatively our doses and in this way is of great aid. But there has been devised no way of

estimating the number of such units needed by a particular person suffering from diphtheria. This we can determine empirically only—not entirely by any particular symptom in a given case, but by the observation of a great number of similar cases.

Of course our dose must be determined to a great extent by the size and susceptibility of the patient, the severity and extent of the lesions, the length of time the patient has been ill and perhaps by the virulence of the disease in a particular epidemic.

I am entirely satisfied that diphtheria antitoxin as generally used is given in doses far too small. Our object should be to accomplish by its use the neutralization of all the diphtheria toxin within the body and the giving of a certain excess of antitoxin for the further use of the body in counteracting fresh toxins that may be formed at the focus of infection.

A discussion of the advisability of using larger doses of diphtheria antitoxin must cover three points:

1. Our objects in giving larger doses.
2. The benefits to be derived from such doses.
3. Possible objections to their use.

The object we have in view is the rapid and complete neutralization of the diphtheria toxin by a single dose of antitoxin, if this be possible. Most cases of diphtheria treated by present methods are given numerous doses of serum—small in comparison with those which may be used safely. In a good percentage of cases the patients recover—when finally the toxins have been balanced by repeated masses of antitoxin in addition to the antitoxin elaborated within the body. Why not make the endeavor to give at once as an initial dose such an amount of antitoxin that this neutralization will be accomplished without delay, and that possibly there will be an excess of antitoxin still in the system to combat toxins later elaborated. To give a dose too small invites disaster by causing delay in checking the disease process. To give too large a dose can do no harm and may be a safeguard for the future.

The benefits derived from so-called large doses through the rapid neutralization of toxins are three-fold:

1. The patient is rapidly cured of the disease.
2. Complications are minimized.
3. The patient's recovery is hastened and the infectious period shortened.

The rapid action of even moderate doses of antitoxin is often marvelous. Far more certain, rapid and permanent are the effects of large doses. By overwhelming the toxins, recrudescences are rendered less liable to occur. Complications, with few exceptions, result directly from the action of the toxins on the vital structures—the heart, kidneys and nervous system. It must be evident at once that if we rapidly neutralize the toxins and avoid the formation of new toxins or forestall their effects, we must be lessening the probability of the occurrence of complications.

Before proceeding to a discussion of the possible harmful effects of large doses, two points should be carefully noted:

A. The location of the disease process and its extent, the virulence of the infection, the patient's general condition and the duration of the illness must all be considered in arriving at a conclusion as to what a correct dose of antitoxin is in every particular instance.

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

B. The following indicates just what I mean by large doses, and what doses I am accustomed to give.

No case of diphtheria, however mild, should receive less than 10,000 units.

Both tonsils well covered with exudate, of one or two days' duration, from 30,000 to 60,000 units.

Both tonsils well covered with exudate, with palate, uvula and nose involved, of three days' duration or thereafter, from 150,000 to 300,000 units.

Nasal cases, simple, 20,000 units.

Nasal cases, with marked symptoms of toxemia, from 50,000 to 150,000 units.

Laryngeal cases, from 30,000 to 45,000 units.

Laryngeal, in combination with other varieties, should mean a corresponding increase in dosage.

The theoretical advantages of large doses have been stated. One practical advantage also is the avoidance of the pain and discomfort of frequently repeated doses. What are the objections which might be urged against the use of large doses?

1. Such an amount of antitoxin might prove harmful to the patient. This is disproved by actual experience. Untoward results from the use of diphtheria antitoxin have followed the use of moderate or even small doses just as often as after the use of large ones. Indeed, it has been shown that such a result is not due to the antitoxic bodies themselves, but to the serum alone. There is then a great possibility that such after-effects might be avoided entirely, certainly minimized, by the higher concentration of the antitoxin.

2. The possibility of anaphylactic shock. In my experience this is extremely rare. Its occurrence is of such great rarity that it cannot be allowed to influence us in the least. Too many lives are lost by too little antitoxin being given to allow a theoretical possibility to keep us from making a cure.

Local sloughing from the bulk of the serum is very rare and will be avoided entirely by further concentration.

My actual results show well in the accompanying table.

RESULTS IN AUTHOR'S CASES

Year	No. of Cases	Deaths	Per Cent.	Dosage
1908	1,426	127	8.55	Very small.
1909	2,153	144	6.69	First year large doses were used.
1910	1,870	120	6.42	Larger doses about as used in 1909.
1911	1,895	130	6.86	Doses smaller than in 1909 and 1910.
1912	1,676	101	6.02	Larger doses used.

The advantages of large doses are really greater than would appear from these statistics, which include deaths from all types of diphtheria.

The benefits to be derived from large doses are less apparent in the treatment of laryngeal diphtheria than in any other form of the disease. This is due to the fact that practically all cases of this variety are sent to the hospital only when far advanced and because the condition then to be combated is not a toxemia, but rather a physical one, due to the location of the membrane. We have to deal with principally a mechanical obstruction to the intake of air resulting in insufficient oxygenation. These deaths are due to asphyxia and exhaustion or to bronchopneumonia, and not to the toxemia of diphtheria.

In our tables this number of laryngeal cases always influences the death-rate. Were we able to show the results of large doses of antitoxin when the toxemia alone must be dealt with, our figures would be even more favorable.

In the septic types, aside from the great satisfaction of feeling that the doubt as to the ultimate outcome has been set aside, we have also the comforting knowledge that by the use of large doses of this specific we have brought to a minimum the chances for the development of that most dreaded of all complications, postdiphtheritic paralysis.

The occurrence of serum sickness and serum rashes is not a bar to the use of large doses. The rashes, however, are frequent, having occurred in 43.4 per cent. of 1,000 carefully analyzed cases.

Of these, 0.3 per cent. were scarlatiniform, and 1 per cent. morbilliform. In 11.2 per cent. no variety was stated, and in 30.9 per cent. the rash was urticarial. The appearance of the rash was as early as a few hours and as late as several weeks. I have never observed dangerous or alarming serum sickness, though a few of the patients have become painfully ill and remained so for as long as a week.

Since, then, there is no bar to the use of large doses, there remains but a summary of my results with their use.

These results are:

1. Prompter local cure.
2. Quicker improvement in the patient's general condition.
3. Permanence of curative action.
4. Avoidance of complications.
5. Reduction of mortality.
6. Harmlessness of large doses.

I doubt, indeed, whether we have as yet used diphtheria antitoxin in doses that give its full therapeutic efficiency.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. WILLIAM H. PARK AND SAMUEL S. WOODY

DR. LEWELLYS F. BARKER, Baltimore: While it is desirable to use enough antitoxin, it has not, in my experience, been necessary to use as large doses as Dr. Park has recommended. I should like to ask Dr. Park if he has seen diphtheria develop in a patient in whom the Schick reaction had been found to be negative? This reaction seems to me very important. Every physician in the country should know about it at once, so that the benefits of this discovery may be widely disseminated.

DR. JOHN F. ANDERSON, Washington, D. C.: Dr. Park's first statements in his summary, that those who are exposed to infection should be immunized, should be emphasized. We have been somewhat scared by anaphylaxis. I believe that anaphylactic reactions from a second injection are very rare and they need not be given much practical consideration. In diphtheria the time of injection is important. Ten thousand units is of more value when given early than 100,000 or 200,000 when given later. I believe that we usually get a full effect without the large doses of 100,000 or 200,000 units of antitoxin.

DR. J. J. KINYOUN, Washington, D. C.: Some years ago we had a number of horses which were not producing the amount of antitoxin they should and we transferred them. They were kept without immunization for four months and then used for other antisera. In two of these horses, tested four years afterward, not having had any antitoxin during this time, the blood showed 16 units per cubic centimeter of antitoxin. The active immunization of these horses would seem to be of long duration. A careful estimate made of the cost per thousand units, just after the precipitating method was introduced, showed that it ran from 6½ to 8¼ cents.

DR. P. S. ROY, Washington, D. C.: If we use larger doses of antitoxin we must reduce the price. According to Dr. Kinyoun a \$5 package costs the manufacturer 37 cents, and

if this is true then we should demand 10,000 or 15,000 units for the price we are now paying for 4,000 units.

DR. GUY L. KIEFER, Detroit: My results are based on a smaller series of cases than Dr. Woody's, some 882 cases since January, 1913. In the first six months of the treatment of these cases the minimum dose was 5,000 units; 5,000 to 10,000 units were given as an initial dose; beginning last July 10,000 units. The mortality rate up to July 1 was 8.24 per cent., and from July 1, 1913, to May 1, 1914, the death-rate was 4.1 per cent. I wish to emphasize early administration. We had no deaths in patients who received the antitoxin on or before the third day. With regard to the kind of case, the comparison between the smaller dose and the larger dose was on cases of approximately the same type.

DR. D. L. RICHARDSON, Providence, R. I.: We should give large doses early. I think that Schick's test would be of more value for the community than in an institution. In institutions the patients are more under control and diphtheria carriers can be separated. Relative to treatment, certainly, large doses should be given. In mild cases, of course, it is not necessary. I had one experience, however, which would need some explanation and in which antitoxin seemed to have a limited value. This was in a nurse who was all right at breakfast time. At noon she had two or three patches. At 5 p. m. cultures were found positive and antitoxin was administered. In all she received 150,000 units of antitoxin. In three or four days she was very ill with virulent diphtheria with edema of the neck, and later cardiac complications, etc. This case was seen early and if not so seen would no doubt have terminated fatally. With reference to early administration, we should obtain for the community what is possible in the hospital. In Boston City Hospital for fifteen years there have been many cases of diphtheria in nurses and doctors without any deaths, and if this can be done in hospitals it should be aimed at in the community.

DR. W. W. TOMPKINS, Charleston, W. Va.: How long after diphtheria has been in a house would Dr. Park lift the quarantine? If the persons in the house were given an immunizing dose, could they go out earlier than those who had not taken the immunizing dose, and are the latter a source of infection? Does Dr. Park advise the large doses sometimes given in diphtheria? Are they safe or necessary?

DR. SAMUEL S. WOODY, Philadelphia: Concerning the time of administering antitoxin, as mentioned by Dr. Anderson, it goes without saying that were we to administer the specific on the first day of the disease, and in a dose of 10,000 units, there would be no further need of antitoxin; furthermore, there would be practically no mortality. All experience bears us out in this statement. I stated in the beginning that my paper was based on personal observation alone. I have tried antitoxin in all-sized doses and in all types of the disease, and am firm in my belief that to obtain the best results we must give the serum in massive doses.

DR. WILLIAM H. PARK, New York: The Schick injection is given with a small hypodermatic syringe with a platinum point and 1/10 c.c. is injected into the skin. A raised whitish spot will be seen over the injection. It covers an area the size of a half-dollar. The injection must go into the skin and not subcutaneously, and the little raised whitish elevation must be obtained. In twenty-four hours it becomes bluish with a slight edema, passes off in forty-eight hours and gradually disappears, but leaves a pigmentation. A false reaction may be found and then a second injection must be given; this is due to the broth and probably happens in only 2 or 3 per cent. of cases. It is perfectly correct to use for four or five weeks. With regard to quarantine—the use of antitoxin does not affect the carrier at all. Carriers need not be prevented from going out. We insist on two negative cultures from the patient before the quarantine is lifted. With regard to Dr. Barker's question: No patient has developed diphtheria after a negative Schick reaction so far as I know. We feel absolutely safe in leaving a case with a negative Schick without immunization. Unquestionably, a patient may receive any amount and in twenty-four hours may develop malignant

diphtheria because the process has started, but after two or three days I have found such cases to be usually of syphilis or angina or something else. Dr. Woody stated that we cannot determine by experimentation how much antitoxin is needed in a given case. We try to give enough to neutralize the toxin in the body. We give the antitoxin in amounts large enough to get it from the tissues to the blood and out again to the local tissues where the toxin is generated; it is, therefore, the speed in getting to these various points which counts. It will be found that one-half of the patients have no toxin in the blood whatever. In the local cases a greater amount will be noted so far as the tissues are concerned. I agree with Dr. Woody that only a single dose of antitoxin is required, 5,000 units in mild, 10,000 in severe and 20,000 in malignant cases. So far as the appearance of the patient goes, the single dose has given better results, and so far as the mortality goes also. Mortality has dropped, probably owing to the single large dose. The antitoxin requires two days for 1/3 to be absorbed and another two days for the other 1/3 to be absorbed, so that it seems impossible that any larger amount will do any good. After twelve hours there is little toxin in the body except possibly locally in the tissues. We have kept to the single dose for the last year and we do this by taking a blood-test before the second injection. Ten thousand units intravenously is worth 100,000 units subcutaneously. We have in every way tested this and we find that larger doses than from 5,000 to 25,000 units make no difference. In the more toxic cases better results are obtained from the intravenous injection, but not so in the others. Forty thousand units will save any patient that 1,000,000 will. I have seen or heard reports of severe shock in a few cases in which large doses have been given, which the small doses would not have caused, but I agree with Dr. Woody that these are few. We have never had a death in our hospital from an injection of serum. I rather feel that a large primary injection coming through safely insures against fatal result from any other injection.

TREATMENT OF UNLOCALIZED INTRACRANIAL INJURIES BY DRAINAGE THROUGH A SUBTEMPORAL APPROACH*

V. P. BLAIR, A.M., M.D.

ST. LOUIS

The emergency service in the City Hospital of St. Louis gives, I believe, exceptional opportunities for the study of intracranial injuries. In the two years, 1910 and 1912 during which I was on the Visiting-Staff, I devoted my spare time to a study of them.

Of course, all cases presenting external or neurologic signs of localized head injury, that can be directly approached, are treated accordingly, but a great many suggest no special point of surgical attack, mostly cases in which the injury is at the base of the brain; these are usually generalized as fractures of the base of the skull. In very few of these is a fracture, if present, the most important lesion, the immediately grave symptoms arising from a concussion injury of the brain and its coverings.

A composite picture of such cases might be presented as follows:

The patient is unconscious or semiconscious, pulse slow, normal or rapid, respiration sometimes stertorous and with more or less disturbance of the reflexes and voluntary movements. The pupillary reflex is the one most frequently disturbed. There may or may not be bleeding from the nose, mouth or ears. Death may follow quickly or recovery may take place. In

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

a running series of eighty patients not operated on it was found that 20 per cent. died in less than two hours and over 50 per cent. in the first twenty-four hours. Of the patients that survived twenty-four hours, about half lingered for several days, being restless and semiconscious; later the pulse became weak and rapid, followed by coma, very high temperature and death.

At necropsy I have never seen a bony depression that could directly account for death, but there is intradural extravasation of blood, thrombosis of some of the cerebral veins with localized softening of the brain; these changes are most marked above the tentorium. In few of these cases there is interventricular hemorrhage or evidence of deep extensive primary brain injury, for such patients die more quickly. There is, however, not infrequently actual pulpefaction of the under surfaces of the frontal and temporo-sphenoidal lobes. These necropsy findings are concurred with by Dr. D. L. Harris, who was for six years pathologist of the City Hospital. The general picture of the late fatalities is the one to suggest that death was due to some secondary circulatory change rather than to the primary injury. This has been designated as an encephalitis, but in very few cases is there evidence that there had been an infection.

It is characteristic of all soft tissues, after injury, to become swollen, because of an increased blood-supply and other changes which follow and which seem to be, at least in part, related to repair.

The brain is enclosed in an unyielding case which does not provide for an increase in bulk, and further, there is frequently an extravasation of blood that actually lessens its normal space. On the theory that the subsequent clinical symptoms and necropsy findings might in part be due to a lack of space and a consequent interference with circulation, a means was sought to correct this. Repeated lumbar punctures were tried but, though this brought about a clear spinal fluid, the results were not satisfactory.

It seemed to me that single or bilateral subtemporal decompression and drainage of the subdural space should be helpful for the following reasons:

The operation is easily and quickly performed, leaving the defect in the least exposed position and protected by the temporal muscle. With the finger in this opening a large part of the orbital surface of the frontal lobe, the under surface of the temporal lobe and a fair part of the convexity of the hemisphere and inner surface of the skull can be explored; clots and also pulped parts of the under surfaces of the temporal and frontal lobes can be withdrawn so that the drainage prevents a further accumulation of blood and rapidly clears the cerebrospinal fluid.

If a disinfectant such as hexamethylenetetramin is used, the drainage of the cerebrospinal fluid insures the dissemination of the disinfectant throughout the subarachnoid spaces.

Finally, the presence of the decompression defect allows for a certain amount of expansion of brain, insuring a freer circulation and possibly accommodation to a hidden clot.

With the help of Dr. A. H. Ryan an effort was made to substantiate or disprove those suppositions by animal experimentation in the physiologic laboratory of the Washington University, with not very conclusive results. These experiments were unsatisfactory for the following reasons:

The concussion injuries of the brain with which we were dealing are dependent on the size of the human

brain and the elasticity of the human skull, which is not to be duplicated in any available animal. As a result it is very difficult to administer a concussion injury from which the animal cannot be revived without operation and which, on the other hand, will not be immediately fatal. We used young kittens that have a comparatively thin calvarium; and in dogs we undertook to overcome the skull resistance by freeing an osteoplastic flap in the vertex and after suturing the scalp allowing the wound to heal entirely before applying the injury blow. A machine, fashioned somewhat after a pile-driver, was contrived that would deliver a blow of measured force. The weight was so controlled that it could travel only a measured distance, varying between 2 and 5 mm., after touching the skull. In some cases the blow was applied to the temporal region without previous osteoplastic operation. In all cases a knock-out blow was given; in some cases the animal died immediately and in most instances artificial respiration was required for a time after the blow. All animals were etherized for the preliminary operation. Animals that showed nervousness were etherized before striking the blow. The machine acted with the greatest precision and the animals that were knocked out without previous etherization suffered no more pain than a felled ox.

In about half the animals that survived long enough, an immediate subtemporal opening was made in the skull and dura, this area having been previously shaved and cleaned. The making of the opening required about three minutes.

The points established at operation were, that an animal struck on the vertex, under the proper circumstances, showed at necropsy a basal clot around the cisterna magna and the interpeduncular space and enveloping the pons and medulla. In animals struck in the same way but on which an immediate subtemporal decompression was done, such a clot was either absent at necropsy or at least absent on the side that was drained.

In some animals the blow was applied low down over the temporal region without previous osteoplastic operation. In one of these it was demonstrated that a dog which had an apparently lethal injury, unconscious, requiring artificial respiration, almost totally paralyzed and with a deep and extensive depressed fracture, in which an immediate subtemporal decompression and drainage was done on the opposite side to the injury, could gradually improve until in ten days almost all paralysis had disappeared. For six days this dog had to be fed with a stomach-tube. We have extensive operative and hospital notes on thirty-seven of these animal experiments.

In the City Hospital we found records of forty-two cases in which a single or bilateral subtemporal operation was done in my service for severe unlocalized intracranial injury, during the two years specified. These operations were done by the residents, Drs. Sewing, Hewitt and Hagler, but the majority by myself. During this period the operation was not done indiscriminately but, it being to us a new procedure, it was done, with few exceptions, only in cases of apparently very severe injury. Lumbar puncture was used to determine the presence of free intradural hemorrhage. Of these injuries, five were deep gunshot wounds of the brain.

Besides the behavior of certain individual cases, the most striking observation in this series is that out of

forty-two cases in which the injury could not be located before operation, in thirty-one, through a single or bilateral subtemporal operation, pulped brain substance, a subdural clot or severe hemorrhage was found and dealt with. In seven others, either an extradural clot or contused brain was exposed.

On account of the diminutive size of this series of operative cases, no statistical conclusions of real value can be drawn, but as a matter of interest I have lately made certain comparisons, between the results in this series, with a running series of eighty basal injuries not operated on in another service. In these eighty cases without operation, there were seventeen deaths within two hours after admittance and for the sake of comparison, these were eliminated, leaving sixty-three injuries not operated on in which there was survival for two hours or more. In the series with operation, seventeen patients were operated on within two hours after the patient was received. The proportion of very early operations would have been much higher if, in the early part of the series, we had not waited to see how the doubtful cases would do without operation. In the latter part of the series, the majority of patients were operated on within two hours after admittance.

In the series of sixty-three patients not operated on who lived more than two hours, 35 per cent. survived.

Of the forty-two patients operated on, 57 per cent. survived.

The time of operation would appear to be important. In half of the successful cases, but in only one-third of the fatal cases, the operation had been done within two hours. Of the patients on whom operation was performed within two hours (and this means that the dura was open within the two hours) 70 per cent. survived. It has already been stated that in sixty-three patients not operated on surviving two hours or more, only 35 per cent. lived.

The significance of time as a factor in prognosis is indicated by the following data:

Of those not operated on who survived twenty-four hours, 58 per cent. ultimately recovered.

Of those operated on who survived twenty-four hours, 75 per cent. recovered.

Of those who survived forty-eight hours, about 75 per cent. in either series ultimately recovered.

Next to disturbance of the sensorium, the most constant single sign of severe brain injury was disturbance of the pupillary reflex. Of patients giving this sign in the series without operation, 27 per cent. recovered; in the series with operation, 57 per cent. recovered.

This comparison between the two series of cases is not presented with the idea of proving a point, but simply as data that are interesting as far as they go. These figures were only lately compiled, but two years ago after watching the operated series here presented, I concluded to open every skull subtemporally of every patient seen early with supposed unlocalized brain injury, and have done this ever since and believe it is a good procedure. The opening of the cerebellar fossa is relatively difficult and shock-producing, and as in most cases the injury is above the tentorium, I have not used this route.

In practice several points have been developed that had not been thought of when the plan was made.

In the presence of an open fracture of the vertex, when on exposing the dura it is demonstrated that the latter has not been punctured but that there is a subdural clot, the latter can be partially removed and

drained through a subtemporal opening with less risk of brain infection or of injury to edematous cortex than if the dura is incised at the site of the original injury. We have done this with satisfactory results several times. Further, if the middle meningeal artery is suspected as being the source of hemorrhage, which is comparatively seldom the case, this vessel can be controlled from the subtemporal wound.

The technic of this operation is simple. A fair area of the temple is shaved and iodine is applied. A curved incision, convexity downward, is made from the pterion to behind the upper attachment of the ear, through the skin and temporal fascia. The temporal artery is caught and the flaps forcefully retracted with hooked retractors. The fibers of the temporal muscle are separated with an elevator and these are drawn apart by retractors held by another assistant. The skull is opened to the size of a half-dollar, the dura incised in several directions, the posterior branch of the meningeal artery being tied or caught with a Cushing clip. The neighboring surfaces of the brain are gently explored, and clots hooked out with the finger. A piece of rubber glove drain is inserted in the direction of the clot and the muscle and skin-flaps are closed. The drain is removed in twenty-four hours. In severe cases, in injuries in which there is evidence of intracranial pressure but no clot found, or when the respiration is disturbed by the operation, it is repeated on the other side. The operation is usually done on the right side first. If after drainage ceases at the wound, there is any evidence of pressure, repeated lumbar punctures are done. If carefully and gently done, I do not believe that the operation described is ever likely to cause real damage. It may hasten death by a few hours or minutes, in a patient who has a rupture of one of the large cerebral arteries, but such a patient would be unconscious and already doomed.

Metropolitan Building.

ABSTRACT OF DISCUSSION

DR. CHARLES A. ELSBERG, New York: I agree with Dr. Blair concerning the importance and the value of subtemporal decompression in fractures of the skull with brain injury, with hemorrhage under or outside of the dura in a large number but not all of the patients. One has to individualize, and to watch each patient; only those patients who show either very marked symptoms from the beginning or who show steadily advancing symptoms require operative interference. A sign of value in this respect is the change in the eyegrounds. One can almost foretell the symptoms of pressure that will appear from the changes in the retinal vessels. When the symptoms are very marked or if the symptoms are steadily progressive, decompression on one or both sides with or without opening of the dura and with or without incision of the cortex is required. One point which has been to me, at least, of the utmost value in doubtful cases is puncture of the skull. We know very well that in not a few of these patients with fractures of the skull the symptoms are due, not to the gross hemorrhage in or around the brain or outside the dura, but to numerous small hemorrhages throughout the brain substance. It is this condition which used to be called cerebral shock. Conditions of this kind often give the symptoms of a gross hemorrhage on the surface of the brain; to differentiate between the cases in which there is a gross injury (in which a subtemporal decompression with removal of the clot is indicated) from those with multiple hemorrhages (where operation is not indicated, except for a secondary edema), puncture of the skull is most useful. To illustrate: if the introduction of the needle through a small skull-opening down to the dura is

negative, push the needle through the dura and aspirate again. In this way one can differentiate between the cases which need operation and those which do not. There is nothing more disappointing than to open a patient's skull for symptoms and find no marked increase of pressure and realize that you have to deal with a case of multiple hemorrhages in which operation would have been better avoided.

DR. C. A. EVANS, Milwaukee, Wis.: It is apparent that this operation has not met with general acceptance. In order to determine whether or not it is worthy of acceptance I believe it is worth while to report the results obtained. I have operated on twenty-five cases by this method. Most of these were cases of basal fracture, in which the injury itself did not afford sufficient relief from pressure, and lumbar puncture showed bloody fluid. There was a mortality of 20 per cent. Taking the average mortality following such injuries without operation as 50 per cent., this is a reduction in mortality of 30 per cent., approximately what Cushing claims for the operation. The saving of life, however, is not the only consideration, for we must guard against the remote possibilities of the injury. In skull injuries with compound or depressed fractures or when a piece of bone has been removed either by the injury itself or by operation, there is less chance of subsequent trouble than there is in the so-called closed skull fractures. If this is true then surely an opening beneath the temporal muscle, over a mute area of the brain, should lessen the danger of cerebral complications. In two of the cases there was an extradural hemorrhage, and this approach permitted the ligation of the main trunk of the middle meningeal artery and the removal of the clot. I believe that this is the approach of choice in middle meningeal hemorrhage. In two of the cases a primary bilateral drainage was done. Three showed no improvement after unilateral drainage and a later drainage was done on the opposite side with recovery. I do not believe a decompression alone is sufficient. The brain should be elevated and a drain placed in the middle fossa. The whole question of intracranial injuries is one of intracranial pressure. The operation is not one for the open treatment of skull fractures but for the open treatment of intracranial pressure. It matters not what this pressure is due to or whether or not there is a fracture. The important thing is the amount of the pressure and the ability of the brain to withstand it. Trauma to the brain, like trauma to any other part of the body, is followed by the processes of reaction, which is a space-restricting process. Subtemporal drainage relieves this space restriction, absorption takes place, and the circulation is given its best chance to return to normal. There is a large percentage of intracranial injuries that are primarily fatal and the mortality cannot be reduced. Some patients will recover whether operated on or not, either because of the non-severity of the injury, or because of relief from pressure afforded by the injury itself or by lumbar puncture repeated as needed; a large percentage will recover only after a basal drainage, some after unilateral, others only after bilateral drainage.

DR. C. E. RUTH, Des Moines, Iowa: In 1889 I reported a case of injury to the skull in which a clot formed beneath the dura and the skull in a child who fell 15 feet and struck on its head on a plank sidewalk. He was trephined and the clot beneath the dura and one beneath the skull and external to the dura were found. The child recovered, and in reporting the case I said we can expect this to occur only in young children in whom the elasticity of the skull is such that after having been driven against the soft brain it will spring away and tear the branches of the middle meningeal artery loose. Immediately after this Dr. J. McFadden Gaston of Atlanta, Ga., wrote me that he had a case in a man aged 56, the symptoms disappearing under purgation, without operation, and the patient died from disturbances of a large clot that formed in the middle fossa extending from the base to the vertex, disproving my theory with regard to the liability of fracture. In another case which occurred in my experience, which was immediately fatal, a clot as large as my hand extended from the base to the vertex of the

skull over nearly the entire skull on one side with absolutely no sign of checking of the skull showing at any point. I wish simply to emphasize the importance of what Dr. Blair has said in his paper with reference to the possibilities of relief from the use of the decompression operation. I take exception to decompression without opening the dura. I can conceive of no such thing being possible except it be in a case in which the blood is extradural. To do a decompression operation it is imperative that we open the dura.

DR. VILRAY P. BLAIR, St. Louis: Dr. Elsberg did not mean to make that statement about not opening the dura. These operative cases were of the most severe type. In almost all of them that was determined by lumbar puncture and by getting free hemorrhage along with the symptoms. Further than this, we became convinced that the chance of saving patients decreased with every hour that the operation was put off. Finally, I believe when one has a brain injury without gross hemorrhage the patient may possibly be helped by a decompression, thus giving a freer circulation.

THE TREATMENT OF TABETIC OPTIC ATROPHY WITH INTRASPINAL INJECTIONS OF SALVARSANIZED SERUM

A PRELIMINARY REPORT

GEORGE T. JOHNSON, M.D., L. Z. BREAKS, M.D.

AND

AUGUST F. KNOEFEL, M.D.

TERRE HAUTE, IND.

While one would expect salvarsanized serum to exert about the same influence on the optic atrophy as on the spinal involvement in tabes dorsalis, we deem the observations made in two cases of tabes with optic atrophy treated by intraspinal injections of salvarsanized serum to be of sufficient interest to warrant reporting them. One was a well-marked case of tabes with optic atrophy; the other showed little outside of the ocular findings.

The technic of Swift and Ellis was followed, as described by Hough¹ and McCaskey.² At first the blood was allowed to stand over night to separate the serum, but later separation was effected by centrifugalization and the whole operation completed at one time. The neosalvarsan was dissolved in about 10 c.c. of reesterilized freshly distilled water in a glass syringe, and the blood was aspirated under 40 mm. negative pressure into a 2-ounce skimmed milk bottle of a Babcock tester, so that there was comparatively little exposure of either to the air. All injections were made in the office.

CASE 1.—W. T. C., man, aged 35, married, no children, lineman, with negative family history, had measles when 7 years old, and eruption without sore throat ten years ago, diagnosed as measles. He knows of no chancre. Vision has been gradually failing during the past year. There are no other symptoms. General health is good.

Ocular examination, Jan. 13, 1914, revealed right vision 20/70, left vision 20/200. Tension is normal. Pupils show marked myosis, and react to light but very slightly. Visual field: Right shows slight concentric contraction. Left also shows defect involving upper nasal quadrant. Color sense has depreciated to such an extent that the patient does not distinguish colors in any portion of field. Fundus shows nerve heads grayish-white with sharp-cut margins. Fundus otherwise normal in appearance.

1. Hough, William H.: Intraspinal Injection of Salvarsanized Serum in the Treatment of Syphilis of the Nervous System, Including Tabes and Paresis, *THE JOURNAL A. M. A.*, Jan. 17, 1914, p. 183.
2. McCaskey, G. W.: The Autoserosalvarsan Treatment of Syphilis of the Central Nervous System, *THE JOURNAL A. M. A.*, Jan. 17, 1914, p. 187.

APPENDICEAL INFLATION

C. C. WALLER, M.D.

LYNDONVILLE, VT.

General examination, Jan. 14, 1914, is negative except for absence of left knee-jerk. There is no anesthesia or incoordination. Wassermann reaction is positive. During the period in which patient was under treatment he was seen frequently and the visual fields were charted many times.

Jan. 23, 1914, 0.9 gm. neosalvarsan intravenously. No reaction. January 24, 30 c.c. 40 per cent. serum in normal salt solution intraspinally. Very little reaction. February 10, 0.9 gm. neosalvarsan intravenously. No reaction. Serum unsatisfactory. February 17, 0.9 gm. neosalvarsan intravenously. No reaction. February 18, spinal injection of 30 c.c. 40 per cent. serum. Little reaction. Subjective improvement in vision. March 14, 0.9 gm. neosalvarsan intravenously. March 15, 30 c.c. 40 per cent. serum intraspinally. March 27, intravenous injection of 0.9 gm. neosalvarsan. March 28, spinal injection of 30 c.c. 40 per cent. serum. April 4, 0.9 gm. neosalvarsan and 30 c.c. 40 per cent. serum. In this case no reactions of any kind followed the intravenous injections of neosalvarsan, and very slight reactions followed the intraspinal injections of serum. These consisted of some pain in head and back of neck. Examination following last treatment showed a slight left knee-jerk. April 24, it was found that while visual acuity, as shown by ability to read test letters, had improved but little, the sector defect in left field had disappeared and patient was beginning to distinguish colors. May 24, vision is: right $\frac{20}{50}$; left $\frac{20}{100}$. Color fields were mapped with 1.5 cm. test object.

CASE 2.—R. W. L., man, aged 37, single, machinist, with negative family history, thirteen years ago had some skin trouble with possible chancre. Patient does not know what diagnosis was made. History otherwise was negative up to two years ago, when vision of right eye began to fail. Vision of left eye began to fail a few months later. For several months right eye has been totally blind. Sight of left has constantly grown worse. Patient had lancinating pains about six months ago.

Ocular examination, February, 1914, revealed right amaurosis. No light perception present. Left vision $\frac{20}{100}$. Entire upper half of visual field wanting. Pupils slightly dilated, right does not react to light directly but consensual reaction is present; left reacts to light very slightly. Patient cannot distinguish colors.

General examination, March 2, 1914, revealed absence of knee-jerks, presence of Romberg sign and marked incoordination of both upper and lower extremities.

March 3, 1914, 0.9 gm. neosalvarsan intravenously. Serum obtained was unsatisfactory. March 10, neosalvarsan 0.9 gm. intravenously. March 11, 30 c.c. of 40 per cent. serum in normal salt solution intraspinally. Quite severe pain in head and back lasting several days. Subjective improvement in vision followed subsidence of reaction. March 24, neosalvarsan, 0.9 gm. intravenously, some leakage occurring outside of vein. March 25, 30 c.c. of 40 per cent. serum intraspinally. Infiltration of right arm at site of injection. April 7, neosalvarsan, 0.9 gm. Ulceration present at site of previous injection on right arm. April 8, 20 c.c. of 40 per cent. serum intraspinally. April 21, patient's visual field was practically the same as when first examined but vision had improved markedly. He read $\frac{20}{40}$; 0.9 gm. neosalvarsan intravenously and 30 c.c. of 40 per cent. serum intraspinally. Quite a severe reaction followed with pain in back, legs and chest. Right arm improved. April 25, subjective vision worse. May 4, subjective vision improved again. Neosalvarsan, 0.9 gm., intravenously and 30 c.c. of 40 per cent. serum intraspinally. Severe reaction followed in a few days. May 18, arm healed. Examination showed that coordination was noticeably improved. Knee-jerks absent. Practically no reactions followed the intravenous injections in this case. May 20, 1914, patient read $\frac{20}{30}$ easily and guessed several letters at $\frac{20}{20}$. Patient now distinguished color, and color fields were mapped with 1.5 cm. test object.

This case is especially interesting because of the rapidity with which sight was being lost and the marked improvement which took place following the intraspinal injections.

This title is open to criticism, but it serves the purpose of introduction to an interesting observation made by myself and assistants at the Brightlook Hospital, St. Johnsbury, Vt.

Nov. 17, 1913, a girl, aged 8, while at stool was suddenly seized with violent cramps in the abdomen, and in a few moments became unconscious, but rallied soon after; nausea and vomiting followed, relieving her distress. Twenty minutes after this attack, I found her exhibiting exhaustion and pallor. The temperature, 98, was subnormal; the pulse was 100; there was slight tenderness in the right quadrant; the bowels were constipated. Her parents informed me that during the past two years attacks similar to this, though not so severe, had occasioned no anxiety, and that the patient had maintained her usual health though she had complained of slight stomach disturbances more or less during this time. I suspected chronic appendicitis with adhesions, perhaps, involving the ileum to a point of partial obstruction.

Acting on my advice the parents consented to an operation, November 20. At the operation I proceeded in the usual manner, and on delivery of the appendix the patient, not being fully anesthetized, began straining with considerable energy, and to my surprise the apparently inoffensive and normal appendix began to inflate to a degree near bursting. With a gauze pad near-by I grasped with both hands the ballooning member to prevent what I felt surely to be impending disaster, and held it until the patient became relaxed, when to my further surprise, I found it necessary to exert gentle pressure to deflate the 2-inch inflation. After removal, I found within the appendix a No. 6 bird shot. No inflammatory changes were observed adjacent to or within the appendix.

This, to my mind, in an emphatic way accounts for many heretofore puzzling phenomena as observed when on operating we have found so little to account for the intense suffering and apparent seriousness of acute cases of ileocecal colic, the appendix usually containing small concretions or foreign bodies.

That the appendix, under favorable conditions, may become enormously inflated is a fact, as in the case noted above. The shot (a fecal concretion may serve in a like manner) occluded the appendix lumen as a ball-valve, preventing ready deflation and thereby causing intense pain and attending phenomena, all of which were, in this case, under authentic observation.

Enforcing Sanitary Laws.—What is true of laws in general is equally true of sanitary laws. Many so-called sanitary and public health laws now on our statutes are an obstacle to progress in preventive medicine. Many good sanitary laws are not enforced and cannot be enforced because public sentiment is not fully alive to the importance of preventive medicine. The natural result of this apathy is a withholding of proper authority and proper appropriations by means of which laws can be enforced. Hence, laws fail in their purpose. One of the greatest needs in efficient public health work in the United States is a national Department of Health, a great central educational institution for research, for information, for cooperation. There must be a well-organized national health department in which must center every function of the government in any way touching public health. The aid and cooperation of this department must be available to every citizen, every community and every city and state board of health in all public health problems, even as the aid of a national Department of Agriculture is now available to every farmer and every farming community. —W. F. King, M.D. in *Jour. Indiana State Med. Assn.*

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SATURDAY, SEPTEMBER 5, 1914

THE NORMAL AND PATHOLOGIC OCCUR- RENCE OF CHOLESTEROL

Any one who reads the literature of modern medicine must be impressed with the growing importance of cholesterol and its derivatives. In connection with the problems of hemolysis and other features of immunochemistry and in relation to various aspects of pathology, this lipid substance has received detailed consideration. Some of the views developed in this connection have found expression in *THE JOURNAL*.¹ In dealing with any component of the organism which is supposed to have importance either in health or disease, it sooner or later becomes desirable to gather statistics concerning the occurrence and distribution of the substance. In the case of cholesterol, few data have been collected as yet by the more recent reliable methods of analysis. From such facts as have been gathered the impression has been gained that the cholesterol content of the individual organs is fairly constant. The newest researches of Thaysen² conducted in the Universities at Lund in Sweden and Copenhagen in Denmark, cast doubt on the current belief. The examination of a considerable number of organs and tissues of healthy animals indicates an unexpectedly wide variation in the content of cholesterol and its esters, respectively. The red blood-corpuses alone furnish an exception with respect to this variability.

It is too early to predict the significance of these unexpected facts. Wide differences in the content of any tissue constituent in conditions of health are sometimes taken as a suggestion that the substance under consideration is an incidental rather than an essential component; otherwise a greater uniformity in the amount present might be expected. The quantity of fat, for example, in the tissues varies widely; whereas the sugar in the blood, the water in the glands, the acid in the gastric juice are instances of the fairly

unchanging presence of indispensable physiologic compounds. This mode of reasoning is, however, far from convincing in any attempt to ascertain the significance of a tissue substance. Further data must be awaited.

In another respect, likewise, the cholesterol situation has experienced a change through recent investigations. Certain pathologists, notably Aschoff of Freiburg and his pupils, have classified a group of pathologic fat accumulations under two types: one the glycerol-ester or true-fat type, the other, the cholesterol-ester variety.³ The conclusions appear to be based largely on the results of purely histologic examinations of tissues. By chemical analyses of a large number of normal and "fatty" organs, however, von Czyhlarz and Fuchs⁴ have failed to discover any unique or undue occurrence of cholesterol esters in comparison with the usual fatty substances in cases in which they might be expected to occur on the basis of the reputed morphologic evidence. Until the chemist and morphologist, each using his own suitable procedure of examination, can agree with respect to the alleged existence of the cholesterol types of fatty degeneration or infiltrations we prefer to adhere to the older views regarding the fatty accumulations.

PELLAGRA AND POTABLE WATERS

The belief that there is an etiologic relationship between water and pellagra is not new. Numerous and varied theories have been offered as to the nature of such a possible relation. Quite unique among these hypotheses, however, is the belief that drinking-water, because of the presence of certain chemical constituents, may be of consequence in the causation of pellagra.

A preliminary note on the relation to pellagra of potable waters containing silica in colloidal solution was first presented by Alessandrini and Scala¹ about a year ago. In a recent monograph of nearly two hundred pages² their views and work are presented at length. In 1909 Alessandrini³ began, in Italy, a series of epidemiologic studies on pellagra which led him to regard the disease as etiologically related to potable waters used in pellagrous sections. He first advanced the idea that pellagra was a filarial infection derived from such waters. Subsequent fuller investigation forced him to abandon this supposition, but left him still convinced of the etiologic connection. He associated with himself a chemist (Scala) who, after

1. Absorption of Fat-Like Substances, editorial, *THE JOURNAL*, A. M. A., Sept. 13, 1913, p. 873; The Heterogeneous Lipoids, *ibid.*, Sept. 13, 1913, p. 875; Reflections Regarding Cholesterol, *ibid.*, Feb. 21, 1914, p. 620.
2. Thaysen, T. E. H.: Beiträge zur physiologischen Chemie des Cholesterins und der Cholesterinester, I. Die Digitoninmethode zur quantitativen Bestimmung des Cholesterins und der Cholesterinester, *Biochem. Ztschr.*, 1914, lxi, 89; II. Der Gehalt normaler Organe an Cholesterin und Cholesterinester, *Biochem. Ztschr.*, 1914, lxi, 115.

3. Kawara, R.: Die Cholesterinester-Verfettung, Fischer, Jena, 1911; also Hanes, F. M.: Bull. Johns Hopkins Hosp., 1912, xxiii, 77.

4. Von Czyhlarz, E., and Fuchs, A.: Ueber die Bedeutung des Cholesterins für die Vorgänge bei der pathologischen Verfettung, *Biochem. Ztschr.*, 1914, lxi, 131.

1. Alessandrini and Scala: Communication to Reale Accademia Medica di Roma, May 25, 1913.

2. Alessandrini and Scala: Contributo nuovo alla etiologia e patogenesi della pellagra, Roma, 1914.

3. Alessandrini: Nuove ricerche sulla etiologia della pellagra, *Poli-clinico, sez. pratica*, fasc. 20, May 15, 1910; and fasc. 26, June 26, 1910. Sulla pellagra in Italia, Osservazioni Epidemiologiche, *Annali di Igiene Sper.*, 1910, xx (N. S.) Fasc. iv.

much investigation, "formulated the suspicion that silicic acid, dissolved in a colloidal state, could produce a chronic intoxication such as is observed in pellagra." The present monograph is an attempt by these two authors to establish the truth of this suspicion or hypothesis.

Since silicon of whatever form in water must be derived from the soil, the writers discuss the relation of soils to waters and give in detail their method of preparing the colloidal solutions and the gelatinous suspensions of silica used in the experiments. In this study they made use also of potable waters obtained from certain pellagrous sections.

Their experimental work was conducted on guinea-pigs, rabbits, dogs and monkeys. It consisted in the injection and ingestion of the above-mentioned solutions and waters along with numerous variations in the diet of the animals, especially with reference to a diet of maize. In some experiments they made additions to their solutions of certain salts, notably of calcium, sodium and aluminum, for the purpose of testing the action of certain electrolytes on the colloidal silica or of the contemporaneous action of the two (that is, colloidal silica and electrolytes) on the organism. Full protocols with histopathologic findings as well as photographs and charts make the report of their experimental work very complete.

In an analysis and discussion of the results, the authors express the conviction that they have produced in their animals a chronic intoxication which not alone in essential features but even in details closely approximates pellagra as seen in man. This they assert is true not only of clinical phenomena but also of morbid pathologic changes.

Their analysis of the pathogenesis of the condition produced in their experimental animals (and of pellagra as well, of course) consists of an elaborate chemical discussion to which scant justice can be done in limited space. A mere outline must serve to show the basis of their argument. Colloidal silica displays more or less affinity for mineral salts and, from metabolic studies on dogs under experiment, Alessandrini and Scala concluded that "without doubt silica in the animal organism acts by accumulating mineral substances and produces in consequence a destruction of tissues." Tracing farther the various chemical changes and relations which, according to them, the silica undergoes, their next conclusion is, "Therefore it seems to us without doubt that the silica fixes the mineral salts on the proteins of the tissues with a continuous, incessant action quite similar to the action of an enzyme or diastase." Carrying the subject a step farther, they think that "conditions exist in the formation of these compounds of protein substances with mineral salts by which the acids of such salts are liberated, because there is a tendency in said compounds to pass from the state of metallo-acido-protein to that of metallo-protein." By further

analysis, argument and experimentation they arrive at their final conclusion, that "pellagra is a malady caused by the forced retention of mineral salts which in turn produces a liberation of acids in excess of the needs of the particular organism; or, in other words, pellagra is nothing more than a mineral acidosis with all of its consequences."

These conclusions, the writers point out, are supported by the metabolic studies made on pellagra by various Italian students, such as Camurri,⁴ Nicolaidi and Grillo,⁵ Moreschi⁶ and others.

Having established to their own satisfaction that "pellagra is a mineral acidosis," the natural treatment would of course be some alkali. For therapeutic use sodium citrate was "selected because it could be used by intramuscular injection without injury, is not caustic, and circulates freely in the tissues, forming by oxidation sodium carbonate, which serves to neutralize the acids present." After preliminary experiments on dogs, several pellagra patients were treated with this substance. Daily injections were given in the gluteal muscles, of 1 c.c. of a 10 per cent. solution. The results were distinctly encouraging in selected cases (that is, comparatively recent cases before permanent damage is done to the tissues).

The prophylaxis of pellagra, if this view is confirmed, resolves itself into the question of supplying communities with suitable potable waters. Some practical suggestions are offered by Alessandrini and Scala for this purpose, the chief of which is that calcium carbonate dissolved in water precipitates the silica which may be present.

Among their general conclusions it may be stated that they lay some stress on the influence of certain electrolytes with which the colloidal silica comes in contact; and they think that alumina, whether in colloidal combination or in a state of simple suspension in water, probably has an action similar to the silica, or at least may aggravate the condition caused by, or reinforce the effects of, the latter. This is of some interest in view of the recent note of Myers and Voegtlin⁷ as to the presence of aluminum salts in certain foodstuffs.

Whatever opinion may be entertained concerning this theory, Alessandrini and Scala have certainly brought to its support an apparently arduous and consistent piece of work. This is far more than can be said of many another idea put forward to account for this disease. Moreover, it would seem comparatively easy in this country to gather at least strong presumptive evidence for or against their view by chemical analyses of the potable waters found in sections in which pellagra is prevalent.

4. Camurri: Contributo allo studio del ricambio materiale nei pellagrosi, Udine, 1908; abstr., in Rivista Pel. Ital., viii, 4, 64.

5. Nicolaidi and Grillo: Contributo allo studio del bilancio alimentare nei pellagrosi, Atti del Congresso Pel. Ital., 1912, p. 314.

6. Moreschi: Le anomalie del ricambio azotato nel pellagroso, Il Morgagni, 1903.

7. Myers and Voegtlin: U. S. Pub. Health Rep., June 19, 1914, p. 1625.

THE MARINE BIOLOGICAL LABORATORY AND
MEDICINE

The dedication of the new buildings of the Marine Biological Laboratory—the gift of the President of its Board of Trustees, Mr. C. R. Crane—at Woods Hole, Massachusetts, July 10, deserves more than incidental notice in medical circles. Louis Agassiz, in America, and Anton Dohrn, in Europe, were among the first to organize seaside laboratories offering opportunities for biologic investigations that are unique. Dohrn's station at Naples has become a Mecca for students from all parts of the world; and the institution at Woods Hole, which is, in a sense, a lineal descendant of Agassiz's original plant at the island of Penikese, founded in 1872, promises to have a usefulness scarcely inferior to that of the European seaside laboratory.

The interrelations of biology and medicine have become so clearly established in recent years that they no longer demand emphasis even before an audience of practitioners. A biologic training has become recognized as one of the indispensable fundamentals on which the study of medicine is properly reared. Biology is related not only to the affairs of every-day life, but also to the routine of medicine, in which it furnishes the indispensable foundation. Hygiene and the disciplines of public health rest on biologic factors. One aspect of modern biology—the cell theory—is an adequate illustration of how a single great generalization in this comprehensive science has revolutionized the study of pathology and physiology, the very basis of medicine. For this reason medicine can only look with pride and interest at the development of new places and instruments for biologic research and at the promise of increased benefits and new discoveries which shall contribute to the advancement of our profession. The Marine Biological Laboratory deserves especial mention, furthermore, for the splendid example which it has furnished of opportunities for investigation that shall be unrestricted by the dictates of custom, inherited prejudices, or the unconcealed demands of local interest and sectional factions. Its progress has been an indication of the stability and permanence of a democratic organization in which freedom has been the dominant character—the freedom of a democracy of learning, as it was termed by one of the speakers at the dedicatory exercises. Freedom of organization, he added, is our one watchword. Cooperation is another. Both are vital and they are interdependent. And so we have, at Woods Hole, a union of forces of scientific men, and through them of institutions that they represent, in order to create conditions as ideal as possible for the progress of science.

In the dedicatory address, on "The Needs of Research," Dr. R. S. Woodward,¹ the president of the Carnegie Institution of Washington, called attention

to how far the popular mind, and how far many disciplined minds, may depart from the meaning we attach to the term research. Even in medical circles one may find indications of false ideas of what the term comprehends. Although an appreciation of the advantages of the spirit of patient investigation over that of stolid conservatism, on the one hand, or reckless inquiry on the other, is making itself manifest widely, there are still many who look on research as a sort of irrational achievement. We should never forget, says Dr. Woodward, that the investigator lives usually in the presence of majorities which do not understand him and that progress is largely conditioned by these majorities. Thus, to journalists and to their readers it would seem that research is akin to necromancy and that its results are produced chiefly by witches of the male sex, otherwise designated in the polite literature of our day as wizards. Closely akin to this infantile fallacy, Dr. Woodward adds, is the more subtle error entertained by a majority, perhaps, of our highly educated contemporaries, that the more remarkable results of research are produced not by the better balanced minds, but by aberrant types of mind popularly designated by that word of ghostly, if not ghastly, implications, namely, "genius."

Men of science are on trial in these days. Money is being furnished lavishly for the endowment of research institutions and the promotion of investigation. It is important to take advantage of the current favorable attitude on the part of a helpful portion of the public and encourage its enthusiasm for the modern research enterprises. The Woods Hole Laboratory certainly represents the latter worthily.

A NEW SERUM REACTION FOR THE DIAG-
NOSIS OF GASTRIC CARCINOMA

Recently several serum tests for the diagnosis of carcinoma have been proposed. Among these may be mentioned Abderhalden's test for specific ferments for cancer-cells, Brieger and Trebing's antitrypsin reaction, the miostagmin reaction of Ascoli, Crile's isolysin reaction and von Dungern's complement-binding reaction. In the hands of careful workers experienced in the special technic, each of these methods seems to demonstrate a substance in the serum of cancer patients which reacts more or less specifically on a substance contained in cancer tissue; but none of the methods hitherto proposed has seemed by virtue of its reliability of result and simplicity of technic to merit general adoption as a diagnostic measure. This does not mean that such a method may not be found, or that further improvement in some of these methods may not make them suitable for general use.

Recently Kelling¹ described a test which in the matter of simplicity answers all practical requirements,

1. Woodward, R. S.: The Needs of Research, Science, Aug. 14, 1914, p. 217.

1. Kelling: Wien. klin. Wchnschr., 1914, xxvii, 927.

being essentially much simpler than the simplest modification of the Wassermann reaction. Whether or not it will meet the requirement of accuracy of result must be determined by further tests. While experimenting on heterolytic serums, Kelling observed that the serum of cancer patients possessed the property of dissolving the red corpuscles of certain other species, notably the hen. The presence of an inhibiting substance in some serums and of lysins in some normal serums prevented the use of the test in this form for diagnostic purposes. These sources of error were obviated by diluting the patient's serum 1:10 with physiologic salt solution and incubating for twenty-four hours at 37 C. (98.6 F.). Equal parts of this diluted serum and a 5 per cent. suspension of hen corpuscles were then incubated for from twenty-four to forty-eight hours and the hemolysis noted. In what way the incubation of diluted serum eliminates the inhibiting substance, which seems to be the case, the author does not explain. It was found that this modification gave positive reaction in about 90 per cent. of cases of gastric carcinoma. As controls, serum from patients in all conditions which require differential diagnosis from carcinoma were used, and also normal serum. Kelling reports a consecutive series of 250 cases of common diseases of the gastro-intestinal tract tested by this method. Among these are sixty-five cases of carcinoma, of which fifty-eight, or about 90 per cent., are positive. Of the 185 other conditions, six cases, or less than 3 per cent., give positive reactions. These six include suppurating cholecystitis, tuberculosis of the peritoneum, appendiceal abscess, tuberculosis of the intestines, "influenza gastrica" and an anemia in which the patient had repeatedly received normal human blood by transfusion.

Kelling finds that a combination of the serum reaction and the miostagmin reaction of Ascoli is of advantage, as the two do not give errors in the same types of conditions.

Another combination which he recommends and which in his series of cases gives 100 per cent. positive in gastric carcinoma with 0 per cent. positive in controls, is with the test for occult blood in the feces. The test for small quantities of blood in the stools evidently is not specific for carcinoma, but the combination of this with the serum test seems to reduce the percentage of error.

Evidently this test is not etiologically specific; but neither is the Wassermann test, which uses as antigen an extract of non-syphilitic tissue. We are unable to explain the biochemical principles which underlie many clinical tests, but this is not sufficient reason for rejecting them if trial proves their merits. Kelling rightly maintains that, in general, no diagnostic test is expected to give accurate results in 100 per cent. of the cases, and that no single test is sufficient basis for a diagnosis; that any test should be regarded as additional evidence, while the diagnosis rests on the sum of

all the evidence. Obviously the lower the percentage of error in a given test the greater is its weight in the sum of the evidence.

A simple laboratory procedure which will be of service in detecting early carcinoma of the stomach will receive a hearty welcome by the medical profession. Further reports on the use of the serum test described by Kelling will be awaited with much interest.

THE PURINS AND ALIMENTARY BACTERIA

One of the experimental difficulties that have been encountered in attempting to explain the transformations of the nucleoproteins and their derivatives, the purin substances, in the organism has consisted in the fact that the total intake of these compounds could rarely be accounted for in the outgo. If, for example, a known quantity of some purin such as hypoxanthin, xanthin, guanin, or even uric acid be ingested, the increased excretion of the supposed end-product of this series ordinarily falls short of what would be expected if the oxidative conversion had been complete up to the uric acid stage in the body. This fact has repeatedly been demonstrated in man. When extract of meat, a product comparatively rich in hypoxanthin derived from muscle tissue, is consumed, the increase in uric acid or other purins in the urine will rarely account for more than about one-half of the purin of the food intake. For this reason it was assumed and taught for a long time that the production and destruction of uric acid proceed simultaneously in the organism. Accordingly the amount found in the urine at any period was believed to represent the balance between these two antagonistic processes.

When, however, it was observed that the introduction of either purins or uric acid into the body parenterally, instead of orally, resulted in a much larger consequent output of uric acid, another explanation suggested itself. Siven¹ argued that perhaps ingested purins are destroyed in considerable part within the alimentary tract through the agency of bacteria. When taken into the body by way of the mouth, therefore, the quantities that would actually be absorbed after escaping the possibility of loss through microbial degradation might be decidedly smaller than the original intake; hence the output would be correspondingly diminished. Injected purins, on the other hand, would be protected from such destruction and consequently reappear quantitatively as uric acid, their end-product.

Although no serious obstacle has stood in the way of explaining the disappearance of purins taken by mouth in the way just outlined, certain observations have not spoken in its favor, to say the least. It has been known that bacteria can decompose purin compounds, but the evidence has given the impression that

1. Siven, V. O.: Ueber den Purinstoffwechsel des Menschen, Arch. f. d. ges. Physiol., 1912, xciv, 283.

this change is not easily accomplished². A renewed investigation of the subject by Siven³ leaves no doubt that a very considerable amount of purins can undergo prompt destruction through the action of such organisms as *Bacterium coli*, and under conditions such as are believed to exist in the digestive tube. We may safely conclude, therefore, that a liberal proportion—as much as 50 per cent. in some cases—of the purin intake can lose its identity before it has had a chance to be absorbed from the gastro-intestinal tract. Whatever enters the blood-stream, however, doubtless escapes destruction and thus forms the precursor of the exogenous uric acid of the urine.

THE PRICE OF CARELESSNESS

The commonplace gains enormously in impressiveness when familiar and long-recognized facts are collected and tabulated. Fourth of July accidents were regarded as inevitable and of comparatively small importance until THE JOURNAL undertook the systematic collection and compilation of the statistics. Presented in the aggregate, they shocked the nation. The American people have long been accustomed to accounts of railroad accidents in the public press. It is only the occasional accident of startling character or unusual magnitude which arouses comment. The public does not appreciate the enormous toll which is paid every year in loss of life and limb because of avoidable accidents on our railroads.

Accident Bulletin 50, just issued by the Interstate Commerce Commission, contains a summary of the accidents resulting in personal injuries caused in the operation of interstate railways during the months of October, November and December, 1913. The facts presented are so appalling that if they were found anywhere else than in a government publication they would be regarded as extreme exaggerations. During these three months, 2,792 persons were killed and 50,776 persons were injured in connection with railway operation. Of these, 191 were killed and 3,726 injured in train accidents; 2,675 were killed and 21,769 injured in accidents other than train accidents, such as fires, floods, landslides and explosions affecting the right of way, and accidents in connection with railroad operation other than those of trains and roadway, while 117 deaths and 29,007 injuries were industrial accidents to employees working on tracks, bridges, stations, engine-houses, shops, wharves or elsewhere. Of the 2,792 persons killed, thirty-four were passengers killed in train accidents, and 137 were employees killed in train accidents. Eighty-five passengers were killed from all causes and 730 employees from all causes, making a total of 815 passengers and employees. The 1,860

other persons killed included trespassers, non-trespassers and employees not on duty, while 117 employees in addition were killed in industrial accidents not connected with railroad operations.

Detailed tables showing the cause and character of the accidents are most interesting and illuminating. For instance, of the 21,769 persons injured through train and other accidents, five persons lost their eyesight, ninety lost arms, forty-seven persons lost their hands, 213 persons lost legs, 143 persons lost feet. Many of those crippled will be incapable of supporting themselves for the balance of their lives and will consequently become dependents. The total loss of working time due to accidents is not shown. With over fifty thousand persons injured in three months, however, the economic loss must be enormous. At this rate there are probably nearly twelve thousand persons killed and over two hundred thousand persons injured every year on our railroads. The majority of these accidents are avoidable either through proper safety devices supplied by the operating company or through care in operation on the part of employees. The price paid for carelessness as shown by the official statement of fact is too enormously heavy to be tolerated.

Current Comment

OHIO IN LINE

One of the most readable and progressive medical journals published by any state organization is the *Ohio State Medical Journal*. It is characterized not only by the scientific value of its articles, but also by the "snap" and "life" which permeate its various departments and especially by the way in which it serves up its state news and matters of interest to the local field which it covers. In fact, the only just criticism that might have been made of this journal was that concerning the standards which governed the admission of advertising matter. This criticism is now removed, for in its August issue the *Ohio State Medical Journal* says in part:

We will not, in the future, print the advertising announcement of any medicinal product that has not received the sanction of the Council on Pharmacy and Chemistry of the American Medical Association.

In other words, *The Journal* will no longer boost unethical nostrums.

Furthermore, we will not print the announcements of sanatoria that are not operated on ethical lines; or of any product, medicinal or otherwise, that does not make a true statement of its value, or does not offer the intending purchaser a "square deal."

We believe that this will make our advertising columns much more valuable to our readers.

This move speaks well for the Ohio profession. As has been said many times, the immediate result of raising the standard of admissible copy to the advertising pages of any journal is a falling off in revenue. This means that the medical profession of Ohio must give its official publication active, moral and financial support.

2. Schittenhelm, A., and Schröter, F.: Ueber die Spaltung der Hefenucleinsäure durch Bakterien, *Ztschr. f. physiol. Chem.*, 1903, xxxix, 203; 1903, xl, 62; 1903, xl, 70; 1904, xli, 284.
3. Siven, V. O.: Ueber den Purinstoffwechsel des Menschen, iii, Mitteilung, *Zur Frage der Spaltung der Purinkörper im Verdauungskanaal*, *Arch. f. d. ges. Physiol.*, 1914, xlvii, 582.

There are, to-day, twenty-three state journals and six privately owned medical journals that have adopted the standard of the Council on Pharmacy and Chemistry as regards proprietary medicine advertisements. These journals are proving that the standard of decency is not an impracticable one. May the physicians of Ohio rally to the support of their journal; they can render no more effective service in the fight against medical fraud and in behalf of scientific medicine.

DIPHTHERIA ANTITOXIN

It may be thought by some that the whole question of the use of antitoxin in diphtheria is settled. Nevertheless, it may be worth while to emphasize certain factors that are not always borne in mind in using it. The chief ones are the quantity to be given and the time and method of administration. The average dose is given in the Pharmacopeia as 3,000 units. While probably a sufficient initial dose in many cases, this quantity is not enough to satisfy the factor of safety. Although 3,000 units will neutralize the toxins formed in the human organism in an average case, it must be remembered that some time elapses before complete absorption takes place and hence before all the antitoxin becomes effective. Meanwhile the average case at the time of injection has become a severe if not a fatal one. A severe case terminating fatally might have remained a mild, average case had a larger initial dose been given. There is a daily growing sentiment that the amount necessary to effect a cure should be given in one dose at the earliest possible hour. Woody¹ states that "no case of diphtheria, however mild, should receive less than 10,000 units." His experience covers almost ten thousand cases and shows a reduction in mortality of 3 per cent. when large doses are used as compared with smaller ones. The point is emphasized by Anderson² that 10,000 units are of more value when given early than 100,000 or 200,000 when given later. It is safe to say that 10,000 units would be much nearer the average dose used in the large metropolitan hospitals than the 3,000 units stipulated in the Pharmacopeia. Although promptness of administration after the onset of the first signs and symptoms has been proved to be the most important element in the successful use of antitoxin treatment, there must be considered as well the method of injection. Smith³ and Park⁴ have shown that when the subcutaneous route is used, the maximum amount of antitoxin is found in the circulating blood only after three or four days. If antitoxin is given intramuscularly this period is of course shortened. It is still further shortened by intravenous injection, which method has been advised for extremely severe cases. When this extreme method is adopted a much smaller amount of antitoxin is required, as action is immediate. It cannot be too often emphasized that antitoxin must be given early; that with a small patch of membrane a smaller dosage may be required than when a complete laryngeal, pharyn-

geal and nasal involvement exists, and that the subcutaneous injections are more slowly absorbed than deep intramuscular ones. The authority of the Pharmacopeia, in its forthcoming revision, should be lent to the aid of experience by stipulation of a larger average dose—for example, 10,000 units—and a sliding scale to inform the physician that the great quantities are sometimes essential.

WAR AND PREVENTIVE MEDICINE

Our Paris correspondent has not written since the declaration of war—August 1. The London *Lancet* of August 22 contains a last word from its Paris correspondent, concerning the beginnings of the war as they affected Paris. He writes: "The greater number of medical men, even those of mature age, in Paris have already gone to take their posts in the Army Medical Service, and your own correspondent is writing you this, his last letter for some time to come, only a few hours previously to his departure to take charge of an ambulance corps, as *médecin chef* in the Army of the East." Lists of medical men remaining in Paris, with their addresses, have been posted in each quarter of the city. Many hospitals have been evacuated and their patients assigned to others. The remaining hospitals care for the wounded, who are already beginning to arrive. Most of the wounded will not be taken to Paris, as this city may perhaps be placed in a state of siege, but are being carried to more distant points. The Faculté de médecine has also been converted into an ambulance station, as well as all the lycées and the public and private schools. Great fear has been expressed by Professor Chantemesse lest infectious diseases should break out in epidemic form. A general revaccination of the population of Paris has been ordered, and huge quantities of antityphoid serum have been prepared.

SOME FACTORS AFFECTING FETAL DEVELOPMENT

Some weeks ago we commented¹ on recent experiments of Bailey and Murlin² who have shown that the initial loss of weight in the first few days following birth may be prevented by extra feedings of a formula of the same composition as the colostrum. In view of the fact that the infant, during gestation, must be affected by the nourishment of the mother with whose metabolism its own is so closely bound, Evvard³ has undertaken experiments to show to what extent this influence may operate. A number of gilts (young sows, prospective swine mothers) were fed on different foodstuffs. The basal ration was corn alone, which is quite deficient in protein and calcium. As supplements were used meat-meal, containing about 60 per cent. protein, 15 per cent. ash and 10 per cent. fat, also clover and alfalfa. The latter substances also contain large quantities of protein and calcium. It was found that in every case the supple-

1. Woody, S. S.: The Use of Antitoxin in Diphtheria, *THE JOURNAL*, this issue, p. 861.

2. Anderson, J. F.: *THE JOURNAL*, this issue, p. 862.

3. Smith: *Jour. Hyg.*, 1907, vii, 205.

4. Park: *Boston Med. and Surg. Jour.*, 1913, clxxiii, 73. Collected Studies from the Bureau of Laboratories, Dept. of Health, New York City, 1912-1913, vii, 27.

1. The Nutrition of the New-Born, editorial, *THE JOURNAL A. M. A.*, Aug. 1, 1914, p. 404.

2. Bailey, H. C., and Murlin, J. R.: The Energy Requirement of the New-Born, *Proc. Soc. Exper. Biol. and Med.*, 1914, xi, 109.

3. Evvard, J. M.: Some Factors Affecting Fetal Development, *Tr. Iowa Academy of Science*, 1913, p. 325; Nutrition as a Factor in Fetal Development, *Proc. Amer. Breeders' Assn.*, 1912, viii, 549.

mented rations resulted in pigs which were larger and stronger at birth than when an equal weight of corn alone was fed. The character of the coat also was better when oil-meal was used than when meat-meal was given. Thus Evvard states that oil-meal has been noted from time immemorial as a coat producer. On the other hand, meat-meal invariably produced larger-boned offspring than did other types of food. The same experiments were carried out with sheep, and it was again shown that the ration tends to affect in some manner the size and vigor of the offspring although the differences are not so marked as when swine are fed entirely on grain. An outlook for further important conclusions is opened up by these experiments. The possibilities are numerous. The production of a quickly-growing, vigorous offspring will offset to a great extent the numerous attacks made on the struggling infant by the diseases of infancy. The human infant is helpless for a period relatively far longer than that of other mammalia. Any knowledge which will aid to give it a more advantageous start on the difficult road it must travel represents progress in infant welfare.

Medical News

CALIFORNIA

Sanatorium Burned.—Fire starting in a defective flue destroyed the main building of the Pasadena Sanitarium, South Pasadena, with a loss of \$30,000.

European Travelers.—Drs. Charles H. Whitman and Orville O. Witherbee, Los Angeles, and Drs. Andrew W. and Ada S. C. Morton, San Francisco, have returned from abroad.—Dr. Aaron S. Green, San Francisco, is believed to be detained in Berlin.

Psychopathic Ward Opened.—The psychopathic building, recently erected at the Los Angeles County Hospital at an expense of \$175,000, has been completed and was formally opened August 3. The ward can accommodate one hundred patients, but only thirty have thus far been transferred.

Personal.—Dr. Raymond B. Mixsell, Pasadena, has sailed for Japan.—County Health Officer Edmund C. Sawyer, Los Angeles, was presented with a gold deputy sheriff's badge by the janitors of the county building, recently.—Dr. Alexander S. Kelly has been reelected president of the Oakland Board of Education.

COLORADO

Home from Abroad.—Drs. Frank N. Cochems, Salida; Dr. and Mrs. Leonard Freeman, Denver; Dr. Caleb W. Presnall, Trinidad, and Dr. and Mrs. Daniel G. Monaghan, Denver, have returned from abroad.

Colorado Physicians Abroad.—Dr. and Mrs. Edgemont D. Welsh, Colorado Springs, sailed for Glasgow, August 25.—Dr. and Mrs. Samuel Caldwell, Colorado Springs, are believed to be in Vienna.—Dr. William A. Kickland and family, who have been in Germany, have reached England.

Personal.—Dr. William B. Davis has returned from his post of duty as vice-consul of the United States at Guadalajara, Mexico.—Dr. James A. Rutledge, Woodmen, has been elected medical director and superintendent of the Colorado Sanatorium, Woodmen.

State Association Meeting.—The annual meeting of the Colorado State Medical Association will be held in Boulder September 9 to 11 under the presidency of Dr. Oscar M. Gilbert, Boulder. The sessions of the organization will be held in the Physicians' Building and in the University of Colorado.

FLORIDA

New Officers.—Manatee County Medical Association at Tampa, August 8: president, Dr. John B. Leffingwell, Bradenton; secretary, Dr. Hol-

Bids for Laboratory Building.—Advertisements have been made by the State Board of Health for bids on the public health laboratory building for the board to be erected at Pensacola at a cost of \$20,000.

Open Air School.—The Florida Open Air School of which Dr. William M. Stinson, Jacksonville, is vice-president, an institution devoted largely to outdoor sports and exercises, will open in Jacksonville October 1.

Personal.—Dr. Hiram Byrd, Port Orange, formerly assistant state health officer, has been appointed president of the Florida Tuberculosis Sanatorium, Trilby.—Drs. William P. Adamson, John S. Helms and Louis A. Bize, Tampa, have returned from abroad.—Dr. James M. Jackson, Jr., Miami, has been appointed a member of the Malaria Committee of the National Drainage Congress.

GEORGIA

New Officers.—First District Medical Society at Savannah: president, Dr. Herman W. Hesse; secretary-treasurer, Dr. Charles Usher, both of Savannah.

Home from Abroad.—Dr. William L. Davis, Albany; Dr. Marion C. Pruitt, Atlanta, and Dr. George R. White, Savannah, have returned from Europe.

Personal.—Dr. DeWitt C. Gilles of the staff of the Bureau of Animal Industry to the United States Department of Agriculture, as the result of a tentative examination, has been appointed chief food inspector to the Board of Central Commissioners of Savannah.—Dr. Carl C. Aven has been appointed chief of clinics at the Atlanta Medical College.—Dr. Clifford A. Peacock has been appointed medical inspector of the schools of Columbus.—Dr. Sidney Walker has been appointed local surgeon at Dublin for the Wrightsville and Tennville Railroad, succeeding the late Dr. Ezra New.

IDAHO

Personal.—Drs. Clifford M. Cline, Idaho Falls, and Franz H. Brandt, Boise, have returned from abroad.—Dr. Charles L. Gritman, Moscow, and Dr. and Mrs. William F. Howard, Pocatello, have sailed for Europe.

County Society Organized.—The president and secretary of the Idaho State Medical Association met with the physicians of Bonner County at Sand Point, July 6, and organized the Bonner County Medical Association, electing the following officers: president, Dr. Ones F. Page, Sand Point; vice-president, Dr. Leseir J. Stauffer, Bonner's Ferry, and secretary-treasurer, Dr. Charles P. Stackhouse, Sand Point.

ILLINOIS

New Hospital.—A new hospital has been opened by A. W. Chandler in Rochelle as a public institution. It is open to all regular practitioners.

Home from Europe.—Dr. Charles B. Horrell, Galesburg, has returned from Europe.—Dr. George N. Kreider, Springfield, sailed from London on his return, August 22.

Werner Improving.—Dr. Frederick W. Werner, Joliet, who has been critically ill with septicemia at the Silver Cross Hospital, Joliet, is slowly improving although not yet out of danger.

Higher Requirements.—In the schedule of minimum requirements issued by the State Board of Health, August 4, this clause is included, "No medical college shall be considered in good standing for the purpose of the Illinois Medical Practice Act, that does not require after July 1, 1918, of all students, excepting graduates of colleges of arts or science to whom advanced standing is given, in accordance with the requirements of this board as a condition of graduation, an attendance on five full courses of lectures in five separate years."

Chicago

Resigns Professorship.—Dr. W. A. Newman Dorland has resigned as professor of obstetrics in the Bennett Medical College.

Home from Europe.—Dr. Truman W. Brophy and daughter; Dr. Franklin H. Martin and niece; Dr. Samuel Salinger and Dr. James P. Way have returned from abroad.

Chicago Physicians Abroad.—Dr. Oscar T. Roberg, who has been in Berlin, has reached Sweden on his way home.—Dr. and Mrs. Peter C. Schenkelberger are detained in France, and Dr. and Mrs. Frederick Owsley have reached London from Berlin.

IOWA

Personal.—Dr. Percy B. Battey, Farragut, has been appointed a member of the medical staff of the Iowa State Hospital, Independence.—Dr. William H. McClain, has been appointed postmaster of Conrad.

More Land for Epileptic Colony.—It is announced that the State Board of Control intends to dispose of sixty acres of land at the site of the State Epileptic Colony, Woodward, and will purchase 160 acres additional more suitable to the purposes of the colony.

In and From Europe.—Dr. Daniel L. Cole and family, Oskaloosa, are believed to be marooned in Germany.—Dr. Elmer P. Weih, West Liberty; Dr. John E. Brinkman, Waterloo, and Dr. and Mrs. Herman A. White, Clinton, have returned from abroad.

Child Welfare Bureau Established.—A permanent Child Welfare Bureau has been established in Iowa City by the Commercial Club and several local organizations of women. At this bureau, parents may obtain information as to the proper care of children, and any child in ill health, whose parents are indigent, will be examined and treated free of charge.

MARYLAND

Farm Donated for Hospital.—The heirs of T. Harrison Garrett have presented the Maryland Hospital for Consumptives, Eudowood, the Pleasant Plains Farm, consisting of 188 acres of fertile land adjoining the hospital property, which has been leased by the hospital for several years.

European Travelers.—Drs. William H. Welch, Baltimore, is in Bern, Switzerland.—Dr. William S. Halsted, Baltimore, returned from Europe, August 11.—Dr. Grant Ferguson of Johns Hopkins Hospital, Baltimore, sailed for Europe, August 6.—Dr. Frank Martin, Baltimore, is reported to be on the continent.

Graduates of Liberal Art Colleges.—Information from the University of Maryland School of Medicine not received in time for the Educational Number shows that ten of the 1914 graduates of that college also possessed degrees in liberal arts. Of the 3,594 graduates of medical colleges this year, therefore, there were 817, or 22.7 per cent., who also held degrees from standard colleges of liberal arts.

Suit Settled Out of Court.—The case of Mrs. Sallie Sterling Sadler, Baltimore, against Dr. George H. Riggs, Ijamsville, in which she obtained a verdict of \$6,000 on March 20, for alleged unlawful confinement in the sanatorium of Dr. Riggs, in which Judge Bond of the superior court of Baltimore granted a motion of Dr. Riggs for a new trial on the ground of excessive damages, has been agreed and settled out of court.

Society to Honor Dr. Beanes.—The Star Spangled Banner Society of Prince George County on September 3 restored, with appropriate ceremonies, the tomb of Dr. William Beanes, located at Marlboro. Dr. Beanes served as surgeon in the General Hospital, Philadelphia, during the Revolution and it was his imprisonment on a British man-of-war which prompted Francis Scott Key to visit him in the hope of securing his relief, and Key's detention during the bombardment of Fort McHenry inspired him to write the Star Spangled Banner.

MASSACHUSETTS

Home from Abroad.—Dr. and Mrs. William E. Chenery, Boston, and Dr. George Van B. Buehler, Cambridge, have returned from Europe.

Pasteur Treatment in Boston.—The State Board of Health announces that the Pasteur treatment for hydrophobia may now be obtained in Boston.

Resigns from Faculty.—Dr. Charles E. Buck, professor in pediatrics in the College of Physicians and Surgeons, Boston, has resigned, following the resignation of two trustees of the institution.

Improvements to Hospital.—The Ladies' Charitable Union of Lawrence has instituted many important improvements at the Lawrence Hospital. At present a children's ward and a new nurses' home are in course of construction and the power house of the institution is being enlarged.

Medical Examiners Appointed.—Dr. Daniel J. Finnegan, Gloucester, has been appointed medical examiner and Dr. Philip P. Moore, Gloucester, associate medical examiner for

Essex County.—Dr. A. Vincent Smith, Middleboro, has been appointed associate medical examiner for Plymouth County.

MICHIGAN

State Society Meeting.—The Michigan State Medical Society will hold its forty-ninth annual meeting at Lansing, September 9 to 11, under the presidency of Dr. Guy L. Kiefer, Detroit.

Interest in Health Train.—Record crowds have visited the State Health Special Train during its stay in the copper country. The train has now left for The Soo, Ishpeming, Marquette and other intermediate towns.

New Officers.—Upper Peninsula Medical Society at Houghton, August 13: president, Dr. James G. Turner, Houghton; vice-president, Dr. Richard A. Burke, Diorite. The next meeting will be held at the Soo.

Home from Europe.—Drs. Frank A. Kelly, Alexander W. Blain and Angus McLean, Detroit; Austin F. Burdick, Lansing; Dr. and Mrs. William F. Hake, Grand Rapids; Dr. and Mrs. William G. Bird and son, Flint, and Dr. Charles E. Boys, Kalamazoo, have returned from Europe.

Michigan Physicians Detained Abroad.—Among the Michigan physicians who are compelled to remain abroad on account of war conditions are, Drs. Max Ballin, Detroit; Dr. and Mrs. William G. Young, Grand Rapids; Dr. Eva Rawlings, Kalamazoo; Drs. Alva N. Collins and Samuel C. Hanna, Detroit; Dr. William T. Dodge, Big Rapids; Dr. Charles H. Baker, Bay City, and Dr. Rowland H. Harris and Elizabeth K. Harris, Battle Creek.

NEW YORK

State Hospital Transferred.—The Long Island State Hospital for the Insane, which has hitherto been leased from the city of New York to the state for the sum of one dollar per year, since the state act went into effect in 1893, was transferred by deed from the city to the state of New York, August 10.

Beef Tuberculosis Board.—In accordance with an act of the legislature authorizing the scientific study of bovine tuberculosis, its economic and health effects on the state, and a report with recommendations to the legislature, Governor Glynn has appointed a committee consisting of Drs. Theobald Smith, Hermann M. Briggs, Linsly R. Williams, Philip Van Ingen and Henry L. K. Shaw, together with a number of veterinarians, cattle breeders and other laymen. An appropriation of \$5,000 is available to pay the expenses of the commission which, at the governor's request, will meet immediately after the members receive their designations to complete the organization and to put the investigation under headway.

New York City

Must Give Full Time to Work.—The commissioner of health has issued an order prohibiting all heads of bureaus receiving a salary of \$5,000 or more, from engaging in any work not connected with the department.

Personal.—Drs. Abr. L. Wolbarst, George Bolling Lee, New York City, and Edward E. Hicks, Brooklyn, have returned from abroad.—Dr. Michael J. Thornton has been appointed chief of staff of the psychopathic ward of the Kings County Hospital, succeeding Dr. William B. Mosely, deceased.—Dr. Jacob Oshlag has been appointed a member of the board of managers of the Manhattan State Hospital.

City Farm for Drug Users.—A committee of city officials of which acting Mayor McAneny is chairman, have decided to ask the Board of Estimate and Apportionment for an appropriation which will enable the city to utilize a part of its Inebriate Farm Colony in Orange County as a sanatorium for drug victims. Practically all the space available in the city hospitals has been given over to this class of patients and it is realized that something must be done to prevent drug victims from crowding out other patients.

Advisory Council of Health Board at Work.—Shortly after taking office the commissioner of health appointed an advisory council in order to effect a closer contact with the public and to secure well informed criticism and suggestions from experts in public health matters. This advisory council consists of representative men and women prominent in various public health activities. At the first meeting of this council suggestions were offered as to new lines of work by the Department of Health. As a result of the discussion at that time seven committees were organized as follows:

Records, Laboratories, Child Hygiene, Infectious Diseases, Foods and Drugs, Sanitation and Public Health Education. All of these committees have held meetings and many valuable suggestions have been presented; these as far as is possible have been acted upon. It is believed that the work of these committees and of the advisory council as a whole will prove of invaluable assistance in the administration of the work of the Health Department.

NORTH DAKOTA

Medical Board of Appointments.—Governor Hanna has reappointed Drs. John E. Countryman, Grafton; Alexander J. McCannel, Minot, and Paul Sorkness, Fargo, members of the State Board of Medical Examiners.

Personal.—Dr. Ralph E. Weible, Fargo, has gone abroad. —Dr. Gustav F. Ruedeger, formerly director of the State Public Health Laboratory, Grand Forks, has returned from the West and has taken up his duties as director of the Health and Research Laboratory at LaSalle, Ill.

State Hospital Overcrowded.—The State Board of Control estimates that one-half million dollars is required for the construction of new ward buildings for the North Dakota State Hospital for the Insane, Jamestown. The institution at present has 316 more patients than its normal capacity.

OHIO

New Officers.—Morgan County Medical Society at McConnellsville, August 14: president, Dr. Leroy S. Holcomb, Pennsville; secretary-treasurer, Dr. Clarence E. Northrup, McConnellsville.

Swimming Pools Contaminated.—An investigation of the swimming pools of Columbus by the health department revealed contamination with colon bacilli in one case and insanitary conditions in others. Dr. Louis Kahn recommended that the pools be treated with chlorid of lime.

State Institutions Crowded.—Statistics gathered by the State Board of Administrations show that state institutions are not capable of caring for all the criminal and insane. Nearly 4,000 names are on the waiting lists in the various counties. When the legislature convenes the board will urge additional hospital facilities.

Summit County Health Protective Society.—The headquarters of this society are at Akron, and a campaign has been begun with the object of increasing the membership to 1,500. The society has resolved to better the sanitary conditions in Akron, and with this object in view will endeavor to secure the support of every citizen.

New Officers.—West Side Physicians' Club, Dayton, reorganized August 21: temporary president, Dr. Grant S. Staub; temporary secretary, Dr. Tedd L. Gregg. —Morgan County Medical Society at McConnellsville, August 14: president, Dr. Leroy S. Holcomb, Pennsville; secretary-treasurer, Dr. Clarence E. Northrup, McConnellsville.

In, and Returned from Zone of War.—Dr. James G. Grant, Akron, with his wife and four children, are reported to be in Berlin. —Dr. Max Stamm, Fremont, is reported to be in Bern, Switzerland. —Drs. Colin R. Clark and James A. Sherbondy, Youngstown; Dr. John V. Hartman, Findlay, and Dr. Henry K. Yaggi, Salem, have returned from abroad.

Anti-Tuberculosis Society Districts State.—The representatives of the Ohio Society for the Prevention of Tuberculosis and the Division of Tuberculosis of the State Board of Health, have divided the state into twelve tentative districts, each of which includes from four to six counties, wherein campaigns are to be inaugurated for the establishment of tuberculosis hospitals.

Sanitation and Disease Prevention Campaign Started.—The Canton Board of Health has started an educational campaign on sanitation and disease prevention. A topic will be chosen and discussed at each regular meeting of the board. Topics already chosen for present and future discussion are: "Rats and Their Relation to Human Plague"; "Pure Milk"; "Infant Mortality," and others allied thereto.

Personal.—The Secretary of the Treasury, on recommendation of the Surgeon-General, U. S. P. H. S., has appointed Dr. Eugene F. McCampbell, Columbus, secretary of the Ohio State Board of Health, collaborating epidemiologist, in the United States Public Health Service. —Dr. Edward K. Cook, police surgeon, of Hamilton, has resigned. —Dr. Stanton K. Crawford, Lakewood, has been appointed super-

intendent of the Five Counties (Columbiana, Mahoning, Portage, Stary and Summit) Tuberculosis Hospital, Springfield Lake, near Akron. The hospital will probably be ready to receive patients early in October. —Dr. Robert C. Paul, Shreve, announces that he will soon move to Wooster, where he will succeed Dr. Kate M. C. Johnson as superintendent of a private hospital.

Cincinnati

Marooned in Europe.—Drs. B. Knox Rachford, Joseph Ransohoff, John M. Withrow and J. Henry Schroeder are among the Cincinnati physicians who are held in Europe on account of war conditions.

Personal.—Dr. J. Stewart Hagen has been appointed city physician, with Drs. Harry M. Box and Joseph W. Hall as assistants. —Dr. Harry T. Summersgill has been chosen as superintendent of the University Hospital, San Francisco.

OKLAHOMA

Personal.—Dr. George A. Boyle, Enid, is taking a trip to Cincinnati, Battle Creek and Chicago, to get new ideas on hospital construction. —Dr. Edward N. McKee, Enid, is taking an automobile trip to Chicago.

Home from Europe.—Prof. Edwin De Barr, head of the department of chemistry of the State University, Norman, has returned from Germany. —Dr. and Mrs. Antonio D. Young, and Dr. and Mrs. Robert M. Howard, Oklahoma City, and Dr. and Mrs. Walter E. Wright, Tulsa, have returned from abroad.

OREGON

New Officers.—Eastern Oregon Medical Society at Pendleton: president, Dr. George W. Tape, Hot Lake; secretary-treasurer, Dr. Thomas M. Henderson, Pendleton (reelected).

Personal.—Dr. Orla B. Miles, Salem, has succeeded Dr. J. Olin Van Winkle, Salem, as health officer of Marion County. —Dr. Frank E. Boyden, Pendleton, has returned from Europe.

Alumni Meeting.—At the annual meeting of the Alumni Association of the Medical Department of the University of Oregon, held in Portland, more than one hundred were present. The program of the three-day meeting consisted of clinics, the presentation of papers, symposiums and post-graduate works.

PENNSYLVANIA

Home from Europe.—Drs. Arthur H. Bernstein and James F. Saltry, Scranton, and Dr. William J. Winters, Shenandoah.

Fire in Nurses' Home.—Fire destroyed the nurses' home of the Pittsburgh Hospital, August 19, causing damage of about \$5,000.

Personal.—Dr. John R. Stein, Shenandoah, is reported to be seriously ill in the State Hospital, Fountain Springs. —Dr. Nathaniel C. E. Guth has taken charge of the Laby clinic at Allentown.

Magazine for Anti-Tuberculosis League.—The initial number of the *Out o'Door Magazine*, the official publication of the Anti-Tuberculosis League, has just appeared at Oil City. It contains interesting information regarding Bon Air and Grand View, the two sanatoriums of the organization.

Emergency Hospital Plan.—Dr. George J. Van Vechten, superintendent of the Scranton Bureau of Health, and the mayor of the city, are discussing plans for buildings to be erected at the State Emergency Hospital. Of the \$25,000 appropriated by the council last year for this purpose, \$7,500 has been expended for a tract of 5 acres on the East Mountain and the balance is to be expended in constructing buildings, laying out roads, clearing underbrush and fencing the property. There is already a nine-room house on the site and it is proposed to erect an administration building, one building for the exclusive use of small-pox cases, and two bungalows, each containing three private rooms, and a ward building with accommodations for from eight to sixteen patients.

Philadelphia

New Hospital Chartered.—A charter authorizing the establishment of a new hospital for the study and treatment of diseases of the digestive system was granted in common pleas court by Judge Ferguson, August 28.

Hospital Corner-Stone Laid.—The corner-stone of the new wing of the American Oncologic Hospital at Thirty-Third

and Powelton Avenue, was laid with appropriate ceremonies on August 28. Addresses were made by the president and secretary of the board of officers.

Personal.—Dr. W. H. F. Addison, assistant professor of histology and embryology at the University of Pennsylvania, has made his way to Holland and will return in September. —Dr. Edward Ledholtz, assistant professor of physiology at the University, who has been working at the University of Bonn, has not been heard from. —Dr. Henry Lowenburg has returned from abroad.

Funds Needed for the Consumptive Hospital.—On August 23 an appeal for funds to carry on the work for the Home for Consumptives at Chestnut Hill was sent out by the Philadelphia Protestant Mission. This institution, which has at present seventy-nine patients, is directed by the mission and is supported almost entirely by voluntary contributions, and the officials have unpaid bills on hands amounting to \$5,000.

SOUTH CAROLINA

Greenville Physicians Abroad.—Drs. R. E. Houston, Ernest W. Carpenter, Thomas T. and Curran B. Earl are detained in Europe by war conditions.

New Officers.—The Second District Medical Association at Bamberg: president, J. J. Cleckley, Bamberg; secretary-treasurer, Dr. Vance W. Brabham, Cope.

Antityphoid Inoculation.—Dr. Asbury F. Coward of the State Board of Health reports that more than 10,000 antityphoid inoculations were made in the state during July.

Tuberculosis Camp Open.—The Tuberculosis Camp established by the Associated Charities of Columbia at Ridgewood has been opened. There are at present four tents and more will be added from time to time as may be required.

Professional Building.—A two-story and basement brick building is being erected on Main Street, Greenville, which will be used by physicians and dentists. The building is to be known as the Professional Building.

Personal.—Dr. James H. McIntosh, Columbia, was shot and seriously wounded, July 22. A reward of \$5,000 for the arrest and conviction of the man who shot Dr. McIntosh has been offered by J. W. Norwood, a banker of Greenville. —Dr. Joseph E. W. Haile, Columbia, charged with malpractice, was exonerated when the case was brought to trial.

Gift to Georgia College.—Dr. William J. Young, Barnwell, has given \$25,000 to the Medical Department of the University of Georgia, Augusta, to be known as the William J. Young Library fund, and to be devoted to the improvement and development of the library of the college. The conditions of the gift provide that the principal be invested and that the income shall be used by the board of directors of the medical department for purchasing and binding such books, magazines and periodicals as may be designated by the dean.

SOUTH DAKOTA

Personal.—Dr. C. A. Homan, Aberdeen, has returned from abroad. —Dr. Burtis T. Green, Brookings, is reported to be detained in Europe. —Dr. Henry E. Binger, Clark, has accepted a fellowship in the University of Minnesota and will move to Minneapolis. —Dr. Leslie G. Hill, Watertown, has resigned after eight years' service as a member of the South Dakota State Board of Health and Medical Examiners.

WASHINGTON

Home from Europe.—Dr. Saxe W. Mowers, Tacoma, and Walter E. Keehl, Cle Elum, have returned from Europe.

New Officers.—Washington Association for Relief and Prevention of Tuberculosis at Tacoma: president, Dr. Christen Quevli, Tacoma; vice-president, Dr. Wilson R. Johnston, Spokane; secretary, Prof. John Weinzirl, Seattle, all reelected. —North End Medical Society at Seattle: president, Dr. Charles A. Warhanik; secretary-treasurer, Dr. Frederick A. Slyfield.

Personal.—Dr. Joseph M. Audic, Spokane, has started for France, where he will join his regiment, the Eleventh Infantry. —Dr. Harry A. Shaw, Seattle, has been elected physician of the Police Relief Association. —Dr. Frank C. Robinson has succeeded Dr. Lawrence R. Quilliam as physician of the State Prison, Walla Walla. —Dr. Elwin Brown, Tacoma, will open a sanatorium for liquor and drug addiction at Lake Bay this fall.

WISCONSIN

New Officers.—First District Medical Society at Hartland, August 7: president, Dr. Willibald J. Wehle, West Bend; secretary-treasurer, Samuel B. Ackley, Oconomowoc.

European Travelers.—Drs. F. Gregory Connell and Neil Andrews, Jr., Oshkosh, and W. Weber Kelley, Green Bay, have returned from abroad. —Dr. Adolph Roos, Oshkosh, with his wife and daughter, is believed to be in Vienna.

GENERAL

Conference on Tuberculosis.—The Mississippi Valley Conference on Tuberculosis will be held at St. Louis, October 6 to 8.

Osler Urges Typhoid Vaccination.—Sir William Osler has sent a letter to the London *Times*, urging the emphatic necessity of enforcing antityphoid vaccination in the British army.

Missouri Valley Physicians to Meet.—The twenty-seventh annual meeting of the Medical Society of the Missouri Valley will be held at Colfax, Iowa, September 17 to 19. The Hotel Colfax will be the headquarters and meeting place, and on September 19 a clinical session will be held at Des Moines. Dr. Flavel B. Tiffany, Kansas City, is president, and Charles Wood Fassett, St. Joseph, Mo., is secretary of the society.

Sioux Valley Physicians Meet.—At the annual meeting of the Sioux Valley Association in Sioux Falls, S. Dak., the following officers were elected: president, Dr. Robert Evans, Fort Dodge, Iowa; vice-presidents, Drs. Julius A. Hohf, Yankton, S. Dak., and Charles L. Sherman, Luverne, Minn.; secretary, Dr. George S. Browning, Sioux City, Iowa, and treasurer, Dr. Walter R. Brock, Sheldon, Iowa.

Bequests and Donations.—The following bequests and donations have recently been announced:

Boston University School of Medicine, \$5,000 by the will of Dr. Alema J. Flint.
To equip a ward in memory of his brother, William H. Thorndike, \$200,000, by the will of George L. Thorndike, East Boston.
To equip a ward in a hospital in Philadelphia, devoted to contagious diseases, \$25,000, by the will of James M. Holt.
Aultman Memorial Hospital, Canton, Ohio, a lot for the endowment fund and a second lot to be applied to the endowment fund after the death of Susan Palmer, by the will of Johnson Sherrick.
Mrs. J. Clark Stewart, a trust fund of \$35,000, by the will of Dr. J. Clark Stewart, Philadelphia.
Chester County (Pa.) Hospital, a donation of \$6,000 for the endowment of a ward, by Mr. and Mrs. Jackson A. Watt, Oxford.

The New Orleans Plague Situation.—Since the report made last week, two cases of human bubonic plague bacteriologically confirmed have been found in New Orleans. Case 21, Mary Jones, colored, female, widow, aged 84, housewife; residence 1734 Felicity Street; sickened August 26 with left femoral bubo; diagnosis made positive August 28. Case 22, Elmore H. Read, male, aged 30; nativity United States; white; residence 4415 Carondelet Street; sickened August 26; suspicious August 27; positive diagnosis made August 28; right femoral bubo. Cases 65 to 74 of rodent plague have been reported up to August 29. During the week ended August 22, the Outgoing Quarantine Department fumigated 98 vessels with sulphur and 18 vessels with carbon monoxide; burned 5,981 pounds of sulphur; inspected 19,912 tons of outgoing freight and issued 29 clean and 3 foul bills of health. The Department of Overland Freight Inspection inspected 5,889 cars; ratproofed 1,280 cars; condemned 10 cars and killed one rodent in a car. The Department of Field Operations trapped 9,630 rats; fumigated 4 premises; disinfected 92 premises; inspected 3,482 premises; placed 88,316 poisons; served 1,450 notices; made 675 abatements and inspected 117 dead. The Department of Laboratory Operations received 9,329 rodents and examined 7,850; of these 15 were suspicious and in 9 the rats were found infected. Thus far 3 necropsies have been made; 54,885 rodents have been trapped and 51,985 rodents have been examined. —It is reported by the New Orleans papers that the State Board of Health has decided that it cannot add to its appropriation of \$10,000 already made and expended in this campaign, and the governor is said to have announced that the state could not provide anything from the \$150,000 authorized by the legislature to be borrowed for the fight. It is understood, however, that notwithstanding this action, there will be no abatement of the work as mapped out. —At the outset of the campaign it was suggested by Surgeon-General Blue that the federal government and the city of New Orleans should each bear

two-fifths of the expense and the state one-fifth.—It is also reported that in the daily press that the seven plague patients in the North Rampart Street Isolation Hospital have practically recovered from the disease and will be discharged within a week.

CANADA

Canadian Army Medical Service.—There are about 350 medical officers in the Canadian militia and many of these will probably be called on for active duty in the field.

Public Health Meeting Canceled.—Owing to the unsettled conditions due to the war in Europe, it has been decided to cancel the meeting of the Canadian Public Health Association, which was to have been held in Fort William and Port Arthur, Ont., September 10 to 13.

New Health Officers' Association.—The municipal officers of health in the counties of Haldimand, Wentworth, Norfolk, Brant, in the province of Ontario, have organized an association and elected Dr. Thomas A. Bertram, Dundas, president, and Dr. James Roberts, Hamilton, secretary.

Sanatorium Work Suspended.—The Anti-Tuberculosis League of Saskatchewan has had to suspend work on a new sanatorium for tuberculosis being built at Fort Qu'Appelle. The total cost of the building was to be in the neighborhood of \$225,000 and of this amount \$150,000 has been spent. Those who were to find the balance have been unable to find the funds, hence the suspension of the work.

The Academy of Medicine and the War.—A special meeting of the Academy of Medicine, Toronto, was held August 27. One thousand dollars was voted from the funds of the academy to the Toronto Patriotic Fund to provide for the dependents of those who had gone to the front. It was also unanimously decided to undertake without charge, the professional care of the needy dependents of the volunteers. A committee of past presidents will arrange to look after the practices of the professional members who have departed with their regiments.

Personal.—Drs. Andrew R. Gordon, Toronto, and John M. Elder, Montreal, presented the addresses in medicine and surgery, respectively, at the annual meeting of the Saskatchewan Medical Association of Saskatoon, August 18-20.—Mr. Irving Howard Cameron, professor of surgery in the University of Toronto, has offered his services to the British Government, it is understood in connection with base hospital work.—Dr. Wallace A. Scott, Toronto, will be in charge of the Army Medical Service of the Toronto branch of the first Canadian contingent.—Hon. Dr. Bceand, a former member of the Laurier Government, Canada, early entered the Belgian service.—The assistant superintendent of the Toronto General Hospital, Dr. Alfred K. Haywood, is off to the front with the Queen's Own Rifles of Toronto.—Dr. Duncan N. MacLennan, Toronto, has returned from a trip to the Mediterranean.—Dr. Richard A. Reeve, professor of ophthalmology in the University of Toronto, has secured passage and is returning from England.

LONDON LETTER

LONDON, Aug. 14, 1914.

CLINICAL CONGRESS OF SURGEONS OF NORTH AMERICA

(Concluded from page 794)

Cancer of the Breast

Dr. W. L. Rodman, Philadelphia, opened a discussion on this subject. He said that chronic fibrous hyperplasia with cysts, the result of abnormal involution of the breast, is often mistaken for cancer. It generally occurs about the menopause but may be seen in patients from 20 to 30. It differs from cancer in that it is frequently bilateral and painful (early cancer is not painful). The pain is increased before each period, and the superficial veins become enlarged. Cancer, unlike benign neoplasms, soon becomes fixed, but the fixation at first is so slight as to be detectable only by careful examination. Dimpling of the skin, however slight, indicates cancer unless chronic mastitis had previously existed. Too much attention has been paid to dimpling of the nipple. It does not occur in more than 52 per cent. of carcinomas, and is present in 5 per cent. of benign growths and more often in abnormal involution. There is the difference, however, that in cancer the nipple, as well as retracted, is infiltrated, fixed and immobile, whereas in benign growths the nipple is mobile. We should get away from the old teaching that cancer is a disease after 40; 20 per cent. occur between 30 and 40. The differentiation of benign from malignant cysts is even more difficult than in the case of

solid tumors. Thick granular discharge from the nipple is suggestive of carcinoma; in abnormal involution the fluid is fairly sanguineous. Pure blood nearly always means a papillary cystadenoma. In at least 25 per cent. of the cases a skilled diagnostician will fail to make a correct diagnosis. The proper way is exploratory incision. Benign growths are convex on section, pink or pinkish-white; malignant growths are usually concave and creak under the knife and have a gray tint. Though the expert may be able to distinguish benign from malignant growths by inspection, the only safe way is a frozen section at the time of operation.

Mr. Sampson Handley differed from Dr. Rodman in a few small points. Cancer of the breast is not always a fixed tumor and the skin does not always dimple over it. He described his now well-known theory of dissemination by lymphatic permeation. He said that secondary deposits rarely occur at a greater distance than 24 inches from the primary growth.

Intestinal Stasis

Sir Berkeley Moynihan opened a discussion on this subject. The theory of intestinal stasis, he said, asserts that at definite points along the intestinal canal certain membranes, veils or webs are frequently found, which delay the passage of the contents, producing intoxication, which directly causes some diseases and encourages others. He admitted that these membranes are frequently present but believes them to be congenital. As long ago as 1899 he described them in fetuses. Jackson's membrane is commonly congenital, but the bands found at the hepatic and splenic flexures are not seldom congenital. He agreed with Lane's view as to their origin, but he doubted that the bands are responsible for intestinal delay, for the intestine is not hypertrophied. Delay undoubtedly occurs in the typical case of intestinal intoxication, not from obstruction but from inability of the enfeebled intestine to empty itself. The early cases can be greatly helped by massage and paraffin. If operation becomes necessary the lower end of the ileum, cecum and ascending colon are the parts best removed. He condemned ileosigmoidostomy as it nearly always leads to regurgitation back into the colon. The surgeon exceeds his duty if he deals with anything beyond demonstrable lesions. He admitted that he had seen cases of rheumatoid arthritis improved beyond expectation by operative abdominal measures; but it should be remembered that drainage of an infected gall-bladder or removal of a diseased appendix will cure some cases of this disease. Moreover, most of these cases are not benefited by operations for intestinal stasis. He demurred to the wide range of diseases said to be curable by operations for intestinal stasis.

Sir Bertrand Dawson admitted that the successes of colectomy are very striking, but side by side there are great failures. The best results are obtained when the large bowel is definitely diseased. He demurred to the doctrine that the colon is a useless organ just as well removed as left. The mortality of colectomy is considerable, and it is often followed by frequent actions of the bowels at irregular intervals.

Sir Arbuthnot Lane said that in view of the lateness of the hour all he would say was that he was content that his views should be judged by the results.

On behalf of the American surgeons a committee, Drs. Leonard Freeman, Floyd W. McRae and William L. Rodman, drew up resolutions of thanks for the hospitality shown by London surgeons and hospitals to the Clinical Congress of Surgeons of North America.

The Annual Meeting of the British Medical Association

The eighty-second annual meeting of the British Medical Association was held at Aberdeen, unfortunately at the same time as the Clinical Congress of the Surgeons of North America in London. The president, Sir Alexander Ogston, delivered an address on the "Making of a Scottish Medical School." He traced the history of the district from the earliest times, when it was inhabited by the Celts. Later it was invaded by Scandinavians, Teutons and Saxons, who were more maritime races. Their physical differences from the Celts could still be observed. He estimated that 7 per cent. of the population were still of a tolerably pure Celtic type. The newcomers gradually fused with and no doubt in some cases dispossessed the Celts. The university was founded in 1494, a bull for this purpose being granted to Bishop Elphinstone by Pope Alexander VI. The first professor of medicine was James Cuming, who was appointed in 1503.

THE ESTABLISHMENT OF A DEFENSE FUND

At the meeting of the representative body there was an echo of the controversy in connection with the insurance act. A discussion took place on a proposal to establish a special fund for the defense of professional interests chiefly in view of future developments in national insurance, which might be injurious to panel doctors. The object is to make opposition effective by guaranteeing support to those members who otherwise could not afford to resist. The proposal was carried by a large majority. A debate then took place as to whether the fund should be administered by a trust or a trade union. The chief reason in favor of a trade union was that the funds would be inviolable against an action for damages. Several objections were raised. It was pointed out that the case of physicians is widely different from that of railway men or miners. The cohesion of the latter is not possible among physicians who work apart and often in antagonism to one another and not under a common employer. Although a majority report of the council favored the establishment of a trade union, it was decided that the fund should be administered by a trust.

MALINGERING

Sir John Collie, who in consequence of extensive experience with claims for disablement has become an authority on malingering, said that frequently the happening of an accident so perverted the outlook of the victim that he persistently dwelt on and exaggerated all his unusual sensations and in process of time he genuinely believed that he was not fit to work. While labor had become more and more monotonous than it used to be, the stimulus to return to work was much less. Every recollection of an accident brought a further injury to the nervous system and the mind. When confronted with these difficult cases the first and all-important step was to make as certain as possible that no organic disease existed. This was not easy, because certain organic diseases in the incipient stages closely resembled hysteria and neurasthenia. It was often a nice point how much was due to the accident and how much to the patient's own unconscious mental processes. In a railway accident passengers who happened to be asleep or tipsy did not suffer nearly so much subsequently from mental symptoms. It was unfair to insurance companies that physical disabilities should cause incapacity of work for four or six months simply because the patient had not been taken in hand from the mental point of view. He concluded that many of the cases were functional nerve cases and there was less deliberate fraud than might be supposed.

CONFIDENTIAL DEATH CERTIFICATES

Sir Victor Horsley spoke of the need of improvement of the nation's statistics, the importance of which, from the point of view of public health, had, he said, never been realized by the statesmen responsible for preparing them. The association should produce a real "nomenclature of diseases," from which the old loose names, which led to so much inaccurate certification, were expunged. The English and the international lists of diseases were chaotic nonsense. There should be direct certification of the cause of death, and the certificate of death and the cause of death should be separate documents. Among the reforms he advocated was the certification of stillbirths, which would secure for the nation statistics on a subject on which it had none, namely, antenatal conditions, which were to a large extent responsible for infant mortality.

(To be continued)

BERLIN LETTER [Delayed in Transmission]

Personal
BERLIN, July 31, 1914.
Dr. Abel has accepted a call as director of the Hygienic Institute at Jena.
The Strassburg anatomist and anthropologist, Gustav Schwalbe, celebrated his seventieth birthday August 1. He joined the faculty of Freiburg in 1871, but in the same year went to Leipsic as professor extraordinary and in 1873 was called to Jena as regular professor of anatomy as the successor of Gegenbaur. In 1881 he went to Königsberg and two years later settled at Strassburg as the successor of Waldeyer. Among Schwalbe's works on anatomy are especially to be noted his study of the circumvallate papillae discovered by him, and also his studies on the growth of bone and cartilage, on the lymph channels of the eye and on the topography of the brain. Of his anthropologic studies those on

the Neandertal skull, his method of measuring the skull and his investigation of the most ancient races of man are to be noted. Schwalbe has published two text-books on the anatomy of the nervous system and of the organs of sense, and he founded the *Zeitschrift für Morphologie und Anthropologie* and the *Anatomischer Jahresbericht*. Schwalbe resigns his position at the end of the summer semester.

Pathology and Therapy of Cancer

Two important addresses treating of the problem of cancer and its treatment were delivered a few days ago in the Berlin Surgical Society by von Hansemann, the pathologist, and Bier, the surgeon. Von Hansemann divided the history of cancer research into a number of periods.

HISTOLOGY OF CANCER

The first is the histologic morphologic period. This was the beginning of exact investigation by scientific methods. The anatomic structure of cancerous tumors was studied and a number of characters were learned which distinguish them from healthy tissues and from pathologic changes of other sorts. This has the enormous advantage in a practical way that one may operate early on the basis of an early diagnosis of cancer and thus often completely eradicate the malignant disease.

ETIOLOGY OF CANCER

Then followed the etiologic period which, in many places, was not distinguished by an equal scientific character as the first period. This period of investigation had an important result in the development of the irritation theory. This teaches that the origin of a cancerous tumor depends on some sort of irritation, but in such a way that irritants of various kinds may produce the same sort of tumor, or that irritants of the same sort in different individuals may produce different kinds of tumors. Thus we know that the irritation produced by the Roentgen rays may cause cancer. The fine experiments of Fibiger of Copenhagen have shown that such irritation may also be produced by parasites, not in the sense that parasites cause cancer in the same way as the comma bacillus causes cholera, but that the presence of the parasites produces an irritant that in one case may have no consequences; in another case a slight inflammation may be set up; in a third, a benign growth, and in the fourth a genuine cancer may develop.

EXPERIMENTAL CANCER RESEARCH

The third period is that of experimental investigation. On a single occasion it was found possible to transmit a genuine cancer from one rat to another. Then a tumor was found in mice with which experiments were conducted for years almost exclusively. As the work was carried on with great diligence and with abundant means, important scientific results were reached with reference to the biology of cells and to the conditions which favor and hinder the growth of man have been realized, for this tumor of the mouse differs in important respects from the cancer of man and the observations made on it cannot, as a rule, be transferred to human cancer. Just recently, for the first time, through the researches of Fibiger mentioned above, something can be hoped for from experimental investigation because in his experiments genuine cancer was induced.

TREATMENT OF CANCER

Lastly we come to the therapeutic period. As is well known, the therapeutic results which have been obtained with newly discovered remedies, partly by Wassermann, partly by Neuberg and Caspari, have all been achieved in mouse cancer, but so far the same treatment cannot be employed in human beings. The treatment by radium and the Roentgen rays does not stand in the same class. It is rather to be compared with surgical treatment inasmuch as it destroys the tumor but does not actually cure the disease. An actual curative remedy, like the salicylates in articular rheumatism, is known only in such diseases as those in which occasionally the patients recover without treatment. Hitherto, no case is known in which a genuine cancer became cured spontaneously. Von Hansemann emphasized this most decisively, and repeated it with marked energy in the discussion, saying that in all the cases that have been published as spontaneous cures, the disease either was not true cancer or only parts of the tumor receded and there was no general recovery. Consequently von Hansemann comes to the conclusion that it will never be possible to find a specific remedy for cancer.

ROENTGENOTHERAPY OF CANCER PLUS INJECTION OF BLOOD

Bier's address on this subject indicates that new hopes may be entertained. Some years ago, he made experiments with the blood of healthy animals. Lately he has resumed these in conjunction with roentgenotherapy and in a number of cases he has reached quite remarkable results, at least for the time being. He showed a patient who had been repeatedly operated on for cancer of the throat, and still the tumor had grown anew and of greater extent. The pictures which Bier showed from the time previous to the treatment made it clear to every one that the case was very severe. A deep radiation with the Roentgen rays was applied to the tumor, while at weekly intervals from 8 to 10 gm. of the blood of healthy hogs was injected. No trace of the cancerous tumor can be detected now in this patient. Bier did not venture to say how permanent the result would be or what would be the future fate of this patient and others treated in the same manner, and he would not state even his presumptions. An opinion on the favorable side is not possible until after some years.

EFFICACY OF ROENTGENOTHERAPY

Bumm's address, delivered in the Hufeland Society on the cure of deep-lying carcinoma by the Roentgen ray from the surface of the body, is also calculated like the statements of Bier to overthrow the pessimistic view of Hansemann in regard to the curability of cancer. Bumm regards his experiences as very favorable. With radio-active substances, a curative effect cannot be obtained at a greater depth than 2 or 3 cm. from the surface without injury to the neighboring tissues. But in the case of superficial cancerous growths, a quick and apparently permanent cure is obtained. In advanced cases in which infiltrations in the neighborhood of the primary focus have formed, a cure of the superficial cancerous growth is obtained, but under the cicatrix in the depths of the tissues the carcinoma continues to grow, and physicians who see the patient after six months or a year find a healed primary focus with fresh nodules in the deeper tissues. No success has been obtained by the attempt to act on the deeper lying parts by the use of larger doses of radio-active substances or by prolongation of the radiation. The use of the Roentgen rays produced better results as the Roentgen tubes furnish many thousand times the amount of radiant energy that is obtainable from the available quantity of radio-active substances, if the superficial tissues are protected from the intense caustic action and a sufficient action in the deeper parts is obtained without the danger of severe injury to the tissues. The cure of cancer is a question only of the quantity of rays which can be applied to the pathologic tissues. As the intensity of the radiation diminishes rapidly in proportion to the distance below the surface, only the hard rays can be used. Bumm is of the opinion that the Roentgen rays afford the remedy which alone is capable of checking the growth and thus securing a permanent cure of deep, advanced carcinoma.

Marriages

ALFRED L. FOWLER, M.D., Atlanta, Ga., to Miss Helen Achenbach of Roslyn Ranch near Rand, Colo., August 12.

CHARLES F. W. BOVE, M.D., Cumberland, Md., to Miss Cecelia H. Flaig, formerly of Catskill, N. Y., August 22.

HUGH ERSYTHE LORIMER, M.D., Oxford, Ohio, to Miss Sarah Florence Shaw of New Concord, Ohio, August 18.

ALEXANDER EDWIN MCCORNACK, M.D., Elgin, Ill., to Miss Josephine Jernstad of Ishpeming, Mich., August 26.

FREDERICK JOHNSON, M.D., Eau Claire, Wis., to Miss Augusta Lange of New Freedom, Wis., August 12.

ANNE EUNICE COCHRAN, M.D., Brooklyn, N. Y., and Mr. John Emmet Carey of New York City, August 8.

EDWIN VAN NOTE, M.D., Hamilton, Mo., to Mrs. C. M. Perry of Pasadena, Cal., at Galena, Mo., July 9.

CALVIN BREWSTER COULTER, M.D., New York City, to Miss Grace Dickey of Iroquois, S. Dak., August 19.

MAURICE A. HANSON, M.D., to Miss Alice McCoy, both of Osage, Iowa, at Charles City, Iowa, August 13.

WILLIAM S. HECTOR, M.D., to Miss Edna E. Dickens, both of Chicago, at Crown Point, Ind., August 22.

HERBERT ROWELL STOLZ, M.D., to Miss Margaret Post, both of San Francisco, August 8.

Deaths

HASKETT DERBY, M.D. Harvard University Medical School, 1858; a Fellow of the American Medical Association; known throughout the United States as an ophthalmologist; one of the founders and once president of the American Ophthalmological Society; for more than forty years a practitioner of Boston; a medical officer of the Army during the Civil War; for thirty years consulting surgeon to the Massachusetts Charitable Eye and Ear Infirmary; founder of the eye clinic in the Carney Hospital, Boston, in 1887; for many years lecturer on ophthalmology at Harvard Medical School and trustee of the Public Library and of the Children's Institutions Department of Boston; died at his home in Falmouth Foreside, Maine, August 21, aged 79.

MAYNARD GOODING BURGESS, M.D. College of Physicians and Surgeons in the City of New York, 1898; a veteran of the Spanish-American War during which he served in Cuba as a medical officer on the staff of General Wheeler, being discharged on account of permanent disability; died at his home in Herkimer, N. Y., August 14, from the effects of a gunshot wound of the head, believed to have been self-inflicted with suicidal intent while despondent on account of ill health, aged 38.

CARRINGTON MACFARLANE, M.D. College of Physicians and Surgeons in the city of New York, 1861; assistant surgeon of the Eighty-First and One Hundred and Fifteenth New York Volunteer Infantry, during the Civil War; one of the organizers of the Oswego City Hospital and for many years a member of the staff and board of directors; prominent also in commercial enterprises in Oswego, N. Y.; died at his home in that city, August 12, aged 77.

EDWIN PYNCHON, M.D. Eclectic Medical Institute, Cincinnati, 1873; Medical College of Ohio, Cincinnati, 1876; a Fellow of the American Medical Association and a member of the American Academy of Ophthalmology and Otolaryngology; and professor of rhinology, laryngology and otology in the Chicago Eye, Ear, Nose and Throat College; died at his home in Chicago, August 28, from uremia, aged 67.

ROBERT P. MARSHALL, M.D. Miami Medical College, Cincinnati, Ohio, 1873; a member of the Medical Society of the State of Pennsylvania; president of the Armstrong County (Pa.) Medical Association and one of the founders of the Kittanning, Pa., Fair Association; died at his home in Kittanning, August 19, from cerebral hemorrhage, aged 66.

ALBERT MERRITT COOK, M.D. University of Buffalo, N. Y., 1881; Bellevue Hospital Medical College, 1883; for twenty-five years a practitioner of Newcastle, Pa., and a member of the staff of the Shenango Valley Hospital; died at his home in Pasadena, Cal., August 16, aged 59.

JAMES LUTHER VAIL, M.D. Eclectic Medical Institute, Cincinnati, 1899; of Little Rock, Ark.; aged 45; died in St. Vincent's Infirmary, Little Rock, August 17, from the effects of injuries received in a collision between his automobile and another motor car.

WILMOT FREDERICK MILLER, M.D. University of Michigan, Ann Arbor, 1887; of Milwaukee; a Fellow of the American Medical Association, and a specialist in nervous diseases; died in St. Mary's Hospital, Milwaukee, August 14, from diabetes, aged 53.

CHARLES BETTS, M.D. University of Wooster, Cleveland, Ohio, 1890; a Fellow of the American Medical Association; proprietor and superintendent of the Jefferson Hospital, Toledo, Ohio; died at Beulah, Mich., August 16, from heart disease, aged 49.

A. N. PERKINS, M.D. New Orleans School of Medicine, 1858; for many years a practitioner of South Texas, and for eighteen years State Quarantine Officer at Sabine Pass, Tex.; died at the home of his daughter in Houston, Tex., August 13, aged 89.

JAMES ROBIE WOOD, M.D. Bellevue Hospital Medical College, 1867; of New Brighton, N. Y.; a Confederate veteran; while returning from a visit to his daughter in the Philippine Islands; died at sea on the U. S. A. Transport *Logan*, August 9, aged 76.

JOSEPH F. ROBERTSON, M.D. Columbus, Ohio, Medical College, 1881; a Fellow of the American Medical Association, and a practitioner of Steubenville, Ohio, for thirty-five years; died at his home in that city, August 17, from septicemia, aged 62.

Cyrus Ernest Hoover, M.D. Emsworth Medical College, St. Joseph, Mo., 1880; a Fellow of the American Medical Association; and a member of the Medical Society of the Missouri Valley; local surgeon at Hamburg, Iowa, for the Burlington System; died at his home in Hamburg, August 21, aged 56.

William Edward Dillingham, M.D. Denver and Gross Medical College, Denver, Colo., 1903; of Mead, Colo.; while crossing the Mummy Mountains into Estes Park, Colo., August 19, was struck by lightning and instantly killed, aged 35.

William Henry Harrison Gable, M.D. Rush Medical College, 1879; for many years a practitioner of Osage, Iowa; and for four years state physician of the Maccabees; died at the home of his daughter in Boise City, Idaho, August 14, aged 73.

Charles H. Bacon, M.D. Northwestern University Medical School (Chicago Medical College), 1862; surgeon of volunteers during the Civil War; a resident of Lockport, Ill., since 1852; died at his home in that city, August 20, aged 80.

Charles Moman Johnston, M.D. Rush Medical College, 1914; of Idaho Falls, Idaho; formerly assistant in pathology at the Michael Reese Hospital, Chicago; died in that institution, August 15, from typhoid fever, aged 29.

Westley Rogers Wales, M.D. Jefferson Medical College, 1891; a member of the board of health of Cape May, N. J., and formerly physician of Atlantic County, N. J.; died in a sanatorium in Atlantic City, August 11, aged 45.

Frederick F. Chaffee, M.D. New York University, New York City, 1877; a member of the Vermont State Medical Society and Illinois State Medical Society; died at his home in Chicago, August 17, from nephritis, aged 59.

Charley Marion Cunningham, M.D. Starling-Ohio Medical College, Columbus, Ohio, 1909; formerly a practitioner of West Mansfield, Ohio; died in his apartment in Rasacca, Ohio, August 14, from heart disease, aged 32.

Daniel Campbell Rose, M.D. Harvard Medical School, 1869; for thirty-six years town and county health physician of Stoughton and Norfolk County, Mass.; died at his home in Stoughton, August 13, aged 76.

Leonard T. Whaley, M.D. University of Louisville, Ky., 1912; of Winslow, Ind.; was burned to death under his overturned automobile, August 13, while on his way home from the Huntingburg fair; aged 28.

Andrew C. Sheldon, M.D. Cleveland University of Medicine and Surgery, 1876; formerly a practitioner of Des Moines, Iowa; died at his home in Salt Lake City, Utah, August 23, aged 73.

Benjamin Dorr Colby, M.D. Rush Medical College, 1884; a member of the Illinois State Medical Society; died at his home in Austin, Chicago, August 14, from cerebral hemorrhage, aged 64.

Alvin Snyder, M.D. Missouri Medical College, St. Louis, 1873; for forty years a practitioner of Seneca, Kan.; died at his home in that city, August 23, from cerebral hemorrhage, aged 67.

Elmore Ferdinand Arnold, M.D. New York University, New York City, 1885; for many years a practitioner of New York City; died at his home in Londonderry, Vt., August 13, aged 55.

Gwynne Page Harrison, M.D. University College of Medicine, Richmond, Va., 1901; of Blair, W. Va.; was struck by a Chesapeake and Ohio train, August 12, and instantly killed, aged 34.

Frederick Bradford Mitchell, M.D. Wisconsin College of Physicians and Surgeons, 1904; died at his home in Withee, Wis., August 3, from disease of the liver, aged 46.

Alva E. Lyle, M.D. Washington University, St. Louis, 1873; a member of the Missouri State Medical Association; died at his home in Butler, Mo., August 6, aged 66.

Adams Quincy Baird (license, Indiana, 1897); for many years a practitioner of Shelbyville, Ind.; died at his home, August 11, aged 78.

John Lake Roberts, M.D. Atlanta, Ga., Medical College, 1894; died suddenly at his home in Pavo, Ga., June 11, aged 45.

Mark W. Coffee, M.D. Southern Medical College, Atlanta, Ga., 1882; died at his home in Rochelle, Ga., June 30, aged 71.

Ransom F. Rowley, M.D. University of Buffalo, N. Y., 1884; died at his home in Portville, N. Y., August 6, aged 56.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

DIGALEN OMITTED FROM N. N. R.

Report of the Council on Pharmacy and Chemistry

Digalen is a proprietary said to contain a soluble form (digitoxinum solubile Cloetta) of digitoxin, the chief active principle of digitalis. This preparation was accepted by the Council in 1909 for inclusion in New and Nonofficial Remedies. The Council had not at that time determined whether Digalen contained "soluble amorphous digitoxin," as claimed, or not. The product was accepted merely as a standardized soluble and fairly stable digitalis preparation.

After the acceptance of Digalen, the therapeutic claims made for it by the manufacturers increased in extravagance. Meanwhile, evidence was brought forward by various independent investigators which tended not only to show that these therapeutic claims were unfounded, but also to discredit the claim that Digalen contained a principle chemically identical with digitoxin. In view of the obscurity of the whole subject of the chemistry of the digitalis principles, the latter claim (that Digalen was a solution of "amorphous digitoxin") had been an academic issue at the time of the acceptance of the product. When, however, the manufacturers of Digalen sought to mislead physicians by increased and unwarranted therapeutic claims, the Council felt that investigation of the whole matter was imperatively demanded to decide whether or not Digalen should be retained in N. N. R.

The questions at issue were: (1) the presence in Digalen of "amorphous digitoxin"; (2) the constancy of composition and reliability of action of Digalen, and (3) the claim that it causes less gastric disturbance than digitoxin. No satisfactory proof has yet been offered that Digalen contains "amorphous digitoxin." The mass of evidence tends to show that Digalen is not constant in composition or reliable in action, and that, when given in doses corresponding in therapeutic activity, Digalen causes quite as much gastric disturbance as the official galenical preparations of digitalis.

The outcome of protracted negotiations between the Council and the Hoffmann-La Roche Chemical Works may be summed up as follows: 1. The manufacturers promise to hold in abeyance the claim regarding the presence of "amorphous digitoxin." 2. They refuse to concede the variable composition of Digalen. 3. They reassert the claim that Digalen is superior to other digitalis products with respect to liability to cause gastric irritation and consequent vomiting.

In view of the unsatisfactory character of the reply on the second and third points, the Council voted that Digalen be omitted from N. N. R. and that publication of the report on Digalen which appears below, be authorized, as well as of the two reports² (A and B) referred to therein.

W. A. PUCKNER, Secretary.

Referee's Report on Digalen

Because of persistent conflict with Rule 6 (unwarranted therapeutic claims) and Rule 1 (composition) it is recommended that Digalen be omitted from New and Nonofficial Remedies. Also that a copy of the report be sent to the manufacturers, and that publication of this report and the two previous reports submitted to the Council be authorized.

The nature of the problems involved necessitates a somewhat extended discussion of the subject.

Digalen (liquid) is said to contain 1 part of soluble amorphous digitoxin Cloetta in 1,000 parts of glycerin and

1. THE JOURNAL A. M. A., Sept. 11, 1909, p. 869.

2. These reports (A, first report on Digalen and B, examination of Digalen Tablets) will be published in the 1914 Annual Council Reports. A reprint of the entire matter dealing with the rejection of Digalen will be sent on receipt of a two-cent stamp.

1,600 parts of water with 7.5 per cent. of alcohol. One c.c. is said to contain 0.0003 gm. of the amorphous digitoxin.

Digalen was accepted by the Council⁷ and the following footnote was appended to the description in New and Non-official Remedies:

"The Council has not determined whether digalen contains 'soluble amorphous digitoxin' or not, but accepts it simply as a soluble digitalis preparation."

Tablets of Digalen were accepted by the Council as a dosage form of Digalen. Each tablet is said to represent 0.5 c.c. (eight minims) of Digalen (liquid).

One of the principal considerations which led the Council to accept Digalen was that it was regarded as affording a fairly constant and stable preparation of digitalis suitable for intravenous administration; if Digalen is not fairly stable and of fairly constant composition it has no obvious advantage over an active soluble digitalis preparation, such as digitalein.

The evidence now at hand seems to show: 1. Digalen is not of constant composition or activity. 2. The manufacturers, or their agents, continue to make misleading statements. 3. It is merely a solution of certain digitalis principles, probably of digitalein mainly, in impure form.

COMPOSITION

Cloetta⁴ prepared a soluble amorphous substance which he called "Digitoxinum solubile Cloetta," but no information concerning the method of preparation has been published.

Cloetta reported the result of an elementary analysis of his product which he compared to the analyses of digitoxin (crystalline) made by Schmiedeberg and by Kiliani, and stated that there could be no doubt concerning the chemical identity of the two substances.

Kiliani⁵ characterized as preposterous, Cloetta's claim that the active constituent of Digalen is chemically identical with digitoxin and stated that Digalen was merely an impure digitalein. Kiliani has recently reiterated the statement that the so-called "amorphous digitoxin" is not identical with Digitoxin⁶.

Cloetta's failure to publish his method of preparing Digalen places an additional burden of proof on him (or the manufacturers of Digalen), concerning the identity of the product, and in the face of Kiliani's denial of the correctness of Cloetta's contention we must have strong corroborative evidence of Cloetta's claim before we can accept it as being established.

The difficulties of dealing with the chemistry of digitalis are so well known that they hardly require further mention here, but under the circumstances Cloetta cannot be considered as being wholly unprejudiced, and, while the same might perhaps, be said of Kiliani, such evidence as can be deduced tends strongly to support Kiliani's view, and to disprove the contention of Cloetta.

There is much confusion regarding the names which have been applied to the various principles obtained from digitalis, and while it is undesirable that an established name should be given to a newly discovered principle, one might overlook this if no effort were made to associate the therapeutic actions of the two substances to an extent which the truth did not justify.

The Council at that time did not challenge the existence of "amorphous digitoxin" and made no attempt to establish the identity with digitoxin of the substance forming Digalen, the manufacturers of Digalen showing that Digalen and digitoxin were identical in their therapeutic actions were concerned, but the disadvantages of digitoxin. What a serious question when the acceptance of Digalen by the Council becomes a matter of great importance when the manufacturers mislead the physician by these

The evidence which lends support to the view that Digalen and digitoxin are wholly dissimilar may be summarized as follows: Digalen differs greatly in its physical properties from digitoxin and in certain of its physiologic actions, as the manufacturers themselves state, Digalen being amorphous, and soluble in water, while digitoxin is crystalline and insoluble in water. The manufacturers state that Digalen differs from digitoxin in certain of its physiologic actions, but the two substances do indeed, differ far more than they admit.

Cloetta and the manufacturers of Digalen lay especial stress on the claim that Digalen is cumulative to a far less extent than digitoxin, and that it has far less tendency to cause gastric disturbance than the latter. The first of these claims is true; the second is the very opposite of the truth, as we shall show.

We know nothing of the structure of any of the digitalis principles, and even though one were to admit (purely for the sake of argument) that Digalen and digitoxin were chemical isomers, that fact could not be taken to lend any support to the contention that the two substances were identical, in the face of the established fact that they differ physically and physiologically in nearly every particular, and agree only in that they both cause standstill of the heart in the same way—an action possessed also by so dissimilar a substance as barium.

The manufacturers of Digalen support the claim of the identity of their product with digitoxin by stating that "Digalen is a solution of the most active glucoside of digitalis." Of course, it is very generally admitted that digitoxin is the most active principle of digitalis, though there is some question concerning its glucosidal nature.

Digalen is in fact far less active than digitoxin, as has been shown by a number of independent observers* (Worth Hale, 1910; Hatcher and Brody, 1910; Neave, 1907; Miller, 1908; the referee; Weis, 1912).

The essential fact which appears from the investigation of Weis is that *Digalen did not behave like digitoxin in any case.*

Hale also found that Digalen gave atypical actions in which the effects on the central nervous system became prominent. The referee can corroborate these observations of Hale's on frogs, but the convulsive symptoms were prominent with some specimens of Digalen on mammals, though not with others, the more recent specimens of the preparation showing the action prominently.

The results of all these biologic tests, as well as of the physical tests made by Weis, certainly lend no support to the contention of Cloetta that the potent constituent of Digalen is identical with digitoxin, but, on the contrary, they show conclusively that the two substances differ widely in many essentials, and the continued claim of the manufacturers that the "amorphous digitoxin" said to be contained in Digalen is the same as digitoxin, or that it is the most active glucoside of digitalis, can be considered only as misleading, and therefore in conflict with the rules of the Council.

CONSTANCY OF COMPOSITION AND ACTIVITY

The manufacturers of Digalen continue to claim that it is of constant and uniform activity,⁷ and they imply this even when they do not state it in those words; for example, a substance cannot be considered reliable if it is variable in activity. "Digalen is Absolutely Reliable. It is standardized and consequently always uniform. It does not produce gastric disturbances."

That the foregoing is absolutely untrue can be shown abundantly. Hale¹⁵ found Digalen not to be uniformly stable; Weis¹⁴ found very different degrees of activity for Digalen in the liquid and tablet forms, the tablets being but one-third as active as the liquid, and the referee found

* Owing to lack of space a portion of the report is here omitted. A detailed discussion of these results is contained in the full report, contained in the reprint.

7. Clinical Suggestions and Reports, December, 1912, p. 24.

14. Advertisement Brit. Med. Jour., April 26, 1913.

15. Hale: Hyg. Lab. Bull., 74.

1, 1909, p. 869.

hr., 1904, No. 33.

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1913, lxxxv, p. 224.

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very great variations in the activity of different specimens of Digalen, one specimen being almost inert. The results obtained by Miller show that Digalen is sometimes very slightly active, or not at all so.

The foregoing citations show conclusively that Digalen is not of uniform activity. When reliability is claimed for Digalen in contrast to the known variability of digitalis, it must be considered as tantamount to the claim that Digalen is not subject to such variability and it must be held that the manufacturers make misleading statements when they assert that Digalen is absolutely reliable.

The manufacturers claim that Digalen does not produce gastric disturbances (see advertisement cited¹⁶).

It is quite true that when small doses of Digalen are used therapeutically it fails to produce gastric disturbances because it is of such slight activity, as previously stated, but when it is used in amounts which correspond in activity to such doses of the ordinary galenical preparations of digitalis as commonly cause nausea and vomiting it does cause gastric disturbances quite as readily as the latter.

Among the clinicians who have found that Digalen causes gastric disturbances may be cited: Veiel,¹⁶ Mueller,¹⁷ Eichhorst¹⁸ and Teichmann.¹⁹

Eggleston and Hatcher²⁰ compared the emetic and cardiac activity of Digalen and numerous other digitalis bodies and preparations and found that the emetic activity of Digalen was decidedly greater in proportion to its cardiac (or therapeutic) action than was that of digitalis or digitoxin.

In the absence of any evidence to controvert this clinical and experimental evidence, the continued claim that Digalen does not disturb the stomach must be looked on as deliberate misrepresentation.

MISLEADING THERAPEUTIC CLAIMS

The recommendation that Digalen be dismissed from N. N. R. is made with the full appreciation of the fact that the manufacturers of Digalen and their agents have repeatedly stated that they desired to comply with the rules of the Council, and that they have withdrawn several statements to which the Council has taken exception, but the fact remains that despite these reiterations the advertisements of Digalen continue to embody statements which the Council can only consider misleading.

The Council believes that the following advertisements constitute gross therapeutic exaggerations:

"Digalen a sheet anchor in pneumonia; a strong support to the heart in this deadliest of infectious diseases among adults. The prompt action of Digalen, by intravenous or intramuscular injection makes it possible to save lives which might be otherwise hopelessly lost. The best digitalis preparation which we have at the present time."²¹

"The digitalis for children. Because its dosage can be controlled. Endorsed by pediatricists everywhere."²²

"The myocarditis of Tuberculosis so frequently encountered, especially in the advanced stage of the disease, may be controlled with the aid of Digalen. The standard digitalis preparation."²³

"Digalen is Absolutely Reliable. It is standardized and consequently always uniform. It does not produce gastric disturbances."²⁴

Digalen is not a sheet anchor in pneumonia, for there is no drug deserving such a title. Digalen has no action which other digitalis preparations lack, and cannot save lives otherwise hopelessly lost. The dosage of Digalen cannot be controlled any better than that of other digitalis preparations, since its activity is variable. We cannot control the myocarditis of advanced tuberculosis by this, or any other means.

CLAIMED SUPERIORITY

Various digitalis principles, including digitoxin, digitalin (true) and digitalein, have been known for many years. Therapeutically they have been found wanting and there

appears to be no basis for the continued claim that Digalen has any superiority over these several digitalis principles. On the contrary, the evidence is accumulating that Digalen has no advantage in any particular over a solution of digitalein, and misleading claims of the manufacturers and their agents certainly interfere with the formation of that calm and unbiased opinion on the part of the general practitioner, which, when applied to the non-proprietary digitalis principles has caused them to fall into disuse.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

WATER-GLASS IN THE PRESERVATION OF EGGS

To the Editor.—In THE JOURNAL, Aug. 29, 1914, p. 796, C. W. L., Denver, asks for the comparative and practical value of water-glass in the preservation of eggs. During August last year I put down about twelve dozen eggs in a solution of water-glass, one part to ten parts of water. The eggs were used during the winter and by some means half a dozen were left in the jar until this August, when I discovered them on making preparations to put down more. They were in a perfect state of preservation, having remained in the solution twelve months. The water should be sterilized and the eggs strictly fresh when put down, and I doubt if there is any limit to the time they will remain fresh.

B. F. METCALFE, M.D., Greenville, Ohio.

VALUE OF VON PIRQUET REACTION IN ADULTS—RELIABILITY OF BASS-WATKINS TEST

To the Editor.—1. When the von Pirquet reaction for tuberculosis is positively positive in an adult female, is that reaction pathognomonic of tuberculosis either active or latent?

2. Is the Bass-Watkins test for typhoid fever as reliable as the old Widal reaction?

S. W. DOUGLAS, M.D., Eudora, Ark.

ANSWER.—1. A positive result from the von Pirquet reaction indicates the presence of a tuberculous focus but does not distinguish between active and latent tuberculosis. This reaction is given by the majority of adults, and hence is of little value as a test in adults.

2. Yes.

ALCOHOL IN MILK AND URINE

To the Editor.—1. Please give a simple qualitative and quantitative test for the presence of alcohol in milk.

2. What is the reliability and specificity of Anstie's test for alcohol in urine?

R. K.

ANSWER.—1. Probably the best method is to distil the milk, then after adding sodium hydroxide to the distillate, to redistil and test the second distillate obtained for alcohol according to established tests such as the iodoform test or benzoyl-ethyl ester test, etc. It is asserted that the method of E. de Stoecklin (Compt. rend., Acad. d. sc., 1910, cl. 43; abstr., Chemical Abstracts, 1910, iv, 886) will detect alcohol in 4 drops of a solution of a strength of 1 part alcohol in 10,000. For the quantitative test the specific gravity of the distillate obtained quantitatively as described above should be determined and the percentage of alcohol in a known amount of milk calculated therefrom (See Bull. 107, Bureau of Chemistry, U. S. Dept. of Agric.).

2. We have no definite information regarding the reliability and specificity of Anstie's reaction. Merck's Report for 1900, p. 112, states that the emerald green color signifies the presence of alcohol in toxic quantities. In 1877 F. C. Hewett (Proc. Am. Pharm. Assn., 1877, xxv, 275) called attention to "the fallacy of Anstie's bichromate of potassium test for alcohol in urine, unless the latter be first distilled, the fallacy consisting in the reduction into the green oxid, not by alcohol singly, but by some agent present in the urine of persons who are total abstainers from alcohol. If the test be applied to the distillate in case of the alcohol having been taken in sufficient quantity to permit of its excretion in an unchanged form, the test will hold good, but not otherwise."

BLOOD DETERMINATION OF VARIETIES OF MAN

To the Editor.—Is there any known and positive method of determining whether blood is that of a white person or of a negro?

E. C. DUNNING, M.D., Cassopolis, Mich.

ANSWER.—No.

16. Veiel: München. med. Wehnschr., 1906, liii, 2140.

17. Mueller: München. med. Wehnschr., 1909, lvi, 904.

18. Eichhorst: Deutsch. med. Wehnschr., 1905, xxxi, 49.

19. Teichmann: Therap. d. Gegenw., 1907, xlviii, 199.

20. Eggleston, Cary and Hatcher, Robert, A.: The Emetic Action of the Digitalis Bodies, THE JOURNAL A. M. A., Feb. 15, 1913, p. 499.

21. Advertisement in Am. Med., January and February, 1913.

22. Advertisement in Merck's Arch., April, 1913.

23. South. Medical Journal, January to May, 1913, inclusive.

24. Advertisement in Brit. Med. Jour., April 26, 1913.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALBERTA: Edmonton, September 15. Registrar, Dr. Cecil E. Race, University of Alberta, Edmonton.
 COLORADO: Denver, October 6. Sec., Dr. David A. Strickler, Empire Bldg., Denver.
 GEORGIA: Atlanta, October 13-15. Sec., Dr. C. T. Nolan, Marietta.
 IOWA: Wallace, October 6. Sec., Dr. John F. Schmershall, Jerome.
 ILLINOIS: Chicago, October 6-8. Sec., Dr. C. St. Clair Drake, Springfield.
 IOWA: Des Moines, September 10-12. Sec., Dr. Guilford H. Sumner, Capitol Bldg., Des Moines.
 KANSAS: Topeka, October 13-15. Sec., Dr. H. A. Dykes, Lebanon.
 MASSACHUSETTS: Boston, September 8-10. Sec., Dr. Walter P. Bowers, State House, Boston.
 MICHIGAN: Lansing, October 13-15. Sec., Dr. Beverley D. Harison, 504 Washington Arcade, Detroit.
 MINNESOTA: Minneapolis, October 6-9. Sec., Dr. Thomas McDavitt, Lowry Bldg., St. Paul.
 MISSOURI: Kansas City, September 28-30. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.
 MONTANA: Helena, October 6. Sec., Dr. William C. Riddell, Helena.
 NEW YORK: September 22-25. Chief of Examination Division, Mr. Harlan H. Horner, Department of Education, Albany.
 OKLAHOMA: Muskogee, October 6-8. Sec., Dr. John W. Duke, Guthrie.
 RHODE ISLAND: Providence, October 1-2. Sec., Dr. Gardner T. Swarts, State House, Providence.
 WEST VIRGINIA: Clarksburg, October 13. Sec., Dr. S. L. Jepson, 81 Twelfth St., Wheeling.

Kansas February Report

Dr. H. A. Dykes, secretary of the Kansas State Board of Medical Registration and Examination, reports the written examination held at Topeka, Feb. 14, 1914. The total number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass was 75. The total number of candidates examined was 11, of whom 10 passed and 1 failed. Ten candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Yale University	(1912)	77	
Hering Medical College	(1912)	75	
College of Physicians and Surgeons, Kansas City, Kan.	(1900)	76	
Harvard University	(1908)	82	
Kansas City Medical College	(1897)	81	
University Medical College, Kansas City, Mo.	(1902)	87	
Jefferson Medical College	(1913)	79	
University of Tennessee	(1913)	77, 79	
University of Edinburgh, Scotland	(1912)	82	
FAILED			
Meharry Medical College	(1913)		

* No grade given.

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
University of Colorado	(1912)	Colorado
College of Physicians and Surgeons, Chicago	(1906)	Illinois
Kentucky School of Medicine	(1902)	Kentucky
Ensworth Medical College	(1910)	Nebraska
Univ. Medical College, Kansas City	(1907) (1911) (1912)	Missouri
Washington University	(1911)	Missouri
John A. Creighton Medical College	(1912)	Nebraska
Jefferson Medical College	(1889)	New Mexico

Utah April Report

Dr. G. H. Harding, secretary of the Utah State Board of Medical Examiners, reports the written examination held at Salt Lake City, April 2-3, 1914. The total number of subjects examined in was 19; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 8, of whom 5 passed, including 1 osteopath, and 3 failed, including 1 osteopath; for 1 candidate the name of the college is in doubt. Seven candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Denver and Gross College of Medicine	(1905)	80.7	
Gross College of Medicine	(1900)	81	
University of Pennsylvania	(1911)	85.2	
Vanderbilt University	(1900)	82.5	
FAILED			
St. Louis University	(1908)	71.1	

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Medical College of Indiana	(1905)	Indiana
Ensworth Medical College	(1913)	Missouri
University Medical College, Kansas City	(1906)	Missouri
University Medical College	(1907) Iowa	Nebraska
John A. Creighton Medical College	(1913)	Iowa
Ohio-Miami Medical College	(1910)	Ohio
University of Pennsylvania	(1912)	Penna.

Book Notices

DIE KRANKHEITEN DES NEUGEBORENEEN. Von Dr. August Ritter von Reuss, Assistant an der Universitäts-Kinderklinik. Spezieller Teil, Enzyklopaedie der klinischen Medizin. Herausgegeben von L. Langstein, C. von Noorden and others. Paper. Price, 22 marks. Pp. 550, with 90 illustrations. Berlin: Julius Springer, 1914.

The thoroughness of this book, its detailed references to the literature, and its mass of detailed information regarding all of the unusual conditions of the new-born make it a splendid reference book. The chapter on the feeding of the new-born is especially good in its recital of the many difficulties that stand in the way of successful nursing and the best way to overcome them. The chapter on breast injuries and diseases of the alimentary and respiratory tracts is very complete. The same can be said of practically all of the other chapters. All the way through one sees the work of an author who has mastered his subject and presented it in a pleasing objective way. The illustrations greatly enhance the value of the book in that they show at a glance unusual conditions which one can understand much more easily by an illustration than by a long description. The book can be very highly recommended to all interested.

BEDSIDE HEMATOLOGY. An Introduction to the Clinical Study of the So-Called Blood Diseases and of Allied Disorders. By Gordon R. Ward, M.D. Cloth. Price, \$3.50 net. Pp. 394, with 42 illustrations. Philadelphia: W. B. Saunders Company, 1914.

Two admirable qualities characterize this work and form a reason for recommending it highly. The first is its practical character. The work deals with clinical relations and facts and as little as possible with questions of pathology. No time is wasted in the description of unnecessary technic for examinations; indeed, the space given to the examination of blood appears at first to be meager, but the reader will find sufficient details for the practical processes. The greater part of the work is devoted to the description of the different forms of disease of the blood-making organs, and incidentally to the changes in the circulating blood. The second point of advantage is the systematic classification. In an introductory chapter the author discusses the question of classification, and while admitting that his scheme is open to various objections and to the charge of inconsistency, he develops an arrangement which is of great aid to the reader. The first disease that is discussed is lymphemia. The symptomatology of this disease is thoroughly worked out and affords a basis for subsequent comparison with the other forms of blood diseases. In reference to etiology, a possible gastro-intestinal origin is suggested, and this is more distinctly recognized with reference to the general forms of anemia. Addisonian anemia or pernicious anemia is said to be almost certainly due to the activities of a micro-organism. The author says: "The exciting cause is the growth and development of the causal organism. There is evidence to suggest this is a denizen of the intestinal tract, perhaps of the whole alimentary canal." The book is well illustrated with numerous figures and especially two colored plates.

ROTH'S KLINISCHE TERMINOLOGIE. Zusammenstellung der in der Medizin gebräuchlichen technischen Ausdrücke mit Erklärung ihrer Bedeutung und Abteilung. Bearbeitet von Dr. E. Oberndorfer. Eighth Edition. Cloth. Price, 12 marks. Pp. 484. Leipzig: Georg Thieme, 1914.

This is a new and greatly modified edition of a work little known to American physicians. Naturally a dictionary in a foreign language will be of little service to the English-speaking physician even when it includes, as does the present work, a good collection of the medical terms of German origin. The work included at first only such terms as were used in the field of clinical medicine, terms relating to materia medica, chemistry and allied topics being omitted. These defects have been remedied in the present edition with the result of increasing the size of the book by about half. Terms derived from or current in other languages than German are defined, so that the usefulness of the work is materi-

ally increased. This work may be confidently recommended to German readers, and we can only second the hope expressed by the reviser that as Roth's "Clinical Terminology" has maintained its usefulness for thirty-six years, the work in its new form will find many friends.

LEITFADEN DER SÄUGLINGSPEDIATRIE FÜR STUDIRENDE UND ARZTE. Von Dr. Walter Birk, Privatdozenten für Kinderheilkunde an der Universität Kiel. Paper. Price 4.80 marks. Pp. 256, with twenty-five illustrations. Bonn: A. Marcus & E. Webers, 1914.

This little book is a reliable and up-to-date presentation of the subject of diseases of infancy. Inasmuch as pediatrics has largely to do with the infant it naturally follows that so concise a book contains little if anything that is not found in the larger standard text-books on diseases of children.

MENINGOCOCCUS MENINGITIS. By Henry Heiman, M.D., Professor of Pediatrics, New York Polyclinic School and Hospital, and Samuel Feldstein, M.D., Lecturer on Pediatrics, New York Polyclinic School and Hospital. With Introduction by Henry Koplik, M.D., Chief of Service, Mount Sinai Hospital, New York. Cloth. Price, \$2.50. Pp. 313, with 39 illustrations. Philadelphia: J. B. Lippincott Company, 1913.

This monograph is founded on the study of cases occurring in the clinic of Henry Koplik at the Mount Sinai Hospital. In his introduction Dr. Koplik calls attention to the fact that in spite of the value of the Flexner serum the results of the disease on those who recover, especially when the patient is less than 1 year of age, is still extremely serious. The physician needs in coping with this disease every aid to diagnosis and treatment available. The authors have added to their personal experience a review of the literature and have produced a satisfactory account of the disease. The laboratory technic described is such as the practitioner can expect to make use of in his daily work; the technic of spinal puncture and injection is given in a way that may be easily followed. The diagnostic aids to be derived from an examination of the spinal fluid are fully described. These are well summed up in a table adapted from Pfaunder and Schlossman giving in parallel columns the findings in various diseases. The book is well illustrated.

TUBERCULOSIS: ITS CAUSE, CURE AND PREVENTION. A Revised Edition of the "Great White Plague." (A Book for Laymen.) By Edward O. Otis, M.D., Professor of Pulmonary Diseases, Tufts College Medical School. Cloth. Price, \$1.25 net. Pp. 326, with illustrations. New York: Thomas Y. Crowell Company, 1914.

The author does not find that in the five years that have elapsed since his book was first issued under the title "The Great White Plague" any startling discovery has been made regarding either the nature or the cure of tuberculosis. Nor have the methods of fighting the disease been materially changed. The fight is more intense and is carried on with greater resources. The disease is steadily decreasing, and past success brings courage and hope. In the revision the form and substance of the book have been retained with only such changes as increasing knowledge have rendered necessary to bring it up to date.

Why Progress is Slow.—In one of his aphorisms Wundt says that "men think very little and very seldom." The truth of this dictum is indisputable. . . . Herbert Spencer walked about London, notebook in hand, listening to and writing down the matter of the conversation of passers-by. He found it to be of the most ordinary character, chiefly personal, such as "And how was Jemmy when you left him?" or, "She never gives more than tenpence a yard for it," etc. And action, like thought, is often of the simplest kind; however difficult at first to acquire, it has become an easy and self-sustaining reflex. When active thought or energy of a new kind is carried on for a long time or under stress people break down under it; the work can be done for only short periods. It is the custom to point to the great age to which scientific and other very busy men live; but when they do it is because they have as a rule an occupation which they are fitted to carry on without strain.—T. Clay Shaw, *Lancet*, London.

Miscellany

Ready-Made Ligature

The surgical knot illustrated is made on the forceps, the tip of the forceps being slipped through the superposed loops C and D. The loose knot is then slipped back on the forceps nearly to the handle and the vessel is clamped with the forceps as usual. Then the knot is slipped over the tip of the forceps and on the vessel and the ends drawn tight. No further tying is required. The knot was devised by M. G. Wunderlich of Guatemala, and the various steps of its application are illustrated in the *Cronica Medica* of Lima, Peru, 1914, xxxi, 205.



Ready-Made
Surgical Knot

Ethical Advertising—Hints to Certain Medical Journals

Press dispatches indicate that at the Toronto meeting of the Associated Advertising Clubs of America, the keynote of most of the meetings of the different sections was devoted to the consideration of a higher standard of ethics among newspaper publishers and advertising men. It was stated that one meeting discussed the formation of a publishers' organization with a "clean page" as a standard. Most of the speakers took the position that the publishers could no longer deny their responsibility in safeguarding their readers from false advertisements.

While the medical journals should be the first to clean their pages, in this respect it is, nevertheless, a fact that some of the sheets going to doctors' offices throughout the United States carry advertising of the most untruthful and dishonest type. Responsibility of the medical journals' editors cannot be denied. More than that, their responsibility is much greater than that of an ordinary newspaper man, who may be excused from knowing a great deal about the ethics of the medical matter appearing in his pages.

The writer has rarely ever had the heart to criticize the daily newspapers for carrying "Pennyroyal Pills," "Ladies' Safe and Sure," "Peruna," etc., when his desk is covered up with medical journals advertising a delectable line of fakes. We should not forget that physicians may be influenced to use some of the worthless stuff they read about. Oregon has gone so far through the Oregon Social Hygiene Society to influence the legislature to pass an act prohibiting the publication of any advertisements "intended to imply that the advertiser will restore manly vigor, treat or cure lost manhood, stricture, gonorrhea, chronic discharges, gleet, varicocele or syphilis." We all know this is a sensible thing to do. . . . We should not wait for the people to regulate our affairs. The next step of the Oregon legislature would be to prohibit the advertising of fake remedies in medical journals. This would be, and properly, a stinging rebuke to the medical editor and it should not be necessary. Most of them know when their stuff is not acceptable, but the power to regulate it immediately lies with the individual physician. If he should ask the publisher to discontinue his dishonest advertisements that would settle the matter.—*Jour. Oklahoma State Med. Assn.*

The Influence of Schoolbooks on the Eyesight

The study of this question has been made by a committee of the British Association for the Advancement of Science. The report is published in the Proceedings of the eighty-third meeting of the British Association for the Advancement of Science (London, 1914, p. 268). The committee reports that, while attention is given in British schools to the detection and correction of visual defects in school-children, the influence of schoolbooks on the vision is practically ignored. The committee believes that the influence of books on the immature eye of the child is an important

one, and that, hygienically, the later children begin to read from books the better. The suggestion is made that little, if anything would be lost educationally by postponing the use of books in school at least until pupils have reached the age of 7. Oral instruction, wall-charts, blackboards, large pictures and other objects easily seen at a distance are recommended as substitutes for books in school.

The committee suggests a standard of book production, the adoption of which by educational authorities would render unprofitable the publication of books of a lower standard.

Among the hygienic requirements to which schoolbooks should conform the following are enumerated:

The surface of the paper should be neither glossy nor soft. The print of one side should not show through from the other, and the impression of the type on one side should not affect the evenness of the surface of the opposite side.

Books should be stitched with thread, so as to open flat. In books clipped from side to side with wire staples, the convex surface of the page gives rise to eye-strain.

For young children, illustrations from pen and ink drawings are preferable to halftones from photographs and wash drawings. The lettering of diagrams should be large enough to be read easily. Glazed paper may be used for halftone illustrations; it should never be employed for the text.

The ink should be a good black, and evenly distributed. The use of colored inks for reading-matter is strongly deprecated.

Worn stereotypes should be discarded. The ordinary text of schoolbooks intended for continuous reading should not be printed in double columns.

In regard to type faces, the committee expresses no preference between "modern" and "old style," but insists on a clean cut, well-defined type, neither too heavy nor too thin, not elongated vertically, and without excessive contrast between the finer and the heavier strokes. The general form of the letters should be broad and square, with a lateral shoulder on each type so that the letters are distinct. Long serifs should be avoided.

The size of type faces is considered the most important factor in the influence of books on vision. It is of the first importance to induce the young reader to keep a sufficient distance between eyes and book. Specimens of type faces considered acceptable for use at various ages are shown in the report. For children under 7, the smallest type presented has a minimum height of face for the short letters of 3.5 mm. (a little over $\frac{1}{8}$ inch). The use of type as small as that of the editorial pages of THE JOURNAL is not considered advisable for children under 12.

Very long lines of type necessitate great excursions of the eye and make it difficult to pass from one line to the next. Very short lines demand too frequent a change of direction in the movement of the eyes. A line of 4 inches for the largest type and $3\frac{2}{3}$ inches for the other sizes is recommended. Children 8 years old should not have their reading confined to very short paragraphs.

Good margins are restful to the eye and well worth their slight cost. The width of the outer edge in any schoolbook page should not be less than half an inch, and the width of the inner edge not less than three-eighths of an inch.

Copies of exercises, examples and questions produced by the hektograph or other multiplying process should be clear and legible.

It is better to multiply maps than to put much detail into one.

The Labeling Vice

Human vanity eyes all versatility with hostile suspicion. Most of us cannot do even one thing well, and we seldom have sportsmanship enough to applaud the man who excels at two or three. We prefer to label him with the first one of his achievements that attracts our notice. As for any thing else he may do, we look it over and then firmly declare "None genuine without the original label."—R. H. Schauffer, *Century*.

Medicolegal

Death from Non-Abortive Anesthetic

(*State vs. Tippie (Ohio)*, 105 N. E. R. 75)

The Supreme Court of Ohio holds that whoever, with the intent to procure the miscarriage of a woman by the use of an instrument or other means, administers to her a non-abortive drug as an anesthetic preparatory to the use of such instrument or other means of procuring an abortion, and the woman dies in consequence of the administering of such drug before the use of instruments or other means by such person to produce such miscarriage, and it does not appear that such contemplated miscarriage is necessary to preserve her life, or that the procuring of such miscarriage was advised by two physicians to be necessary for that purpose, is guilty of a violation of the provisions of Section 12412 of the Ohio General Code. Under such circumstances every act done and performed in furtherance of such unlawful purpose is an integral part of the whole unlawful transaction, and the fact that death ensues before the final act in the contemplated crime can be accomplished is not a defense to an indictment charging a violation of this section.

If it appears, however, that a non-abortive drug is administered to a woman as an anesthetic to enable a duly authorized and practicing physician fully and carefully to examine into the woman's actual condition for the purpose of determining if it be necessary to produce a miscarriage in order to save her life, and the woman dies from the effect of the drug so administered, and no miscarriage is produced, nor intended to be produced unless the examination discloses that it is necessary to preserve the woman's life, no offense has been committed within the provisions of Section 12412.

Evidence tending to show that no secrecy is maintained in the transaction, that a second physician is called in to administer the anesthetic, that while the woman is in a state of anesthesia the attending physician makes an examination for the purpose of determining whether the fetus is alive or dead, and on such examination does determine that the fetus is still alive, and that it is not necessary to procure a miscarriage in order to preserve the woman's life, and, having so determined, makes no use of any instrument or other means to procure a miscarriage, but immediately desists from further efforts in that direction, and directs that the woman be restored to consciousness, is proper evidence to be admitted for the purpose of showing the absence of criminal intent in administering the anesthetic.

Accident Deemed Cause of Death Notwithstanding Organic Weakness

(*Moon vs. Order of United Commercial Travelers of America (Neb.)*, 146 N. W. R. 1037)

The Supreme Court of Nebraska holds that it could be said that the death of the insured in this case was caused by external, bodily injury when, while going up the steps leading into his yard, he accidentally slipped and fell with force and violence, striking his external body near the region of the heart on a large stone with such force as to cause a rupture of the left auricle of his heart, from which he immediately died. The jury were warranted in finding that the accident was the proximate cause of the death, although the condition of the heart and other organs of the body of the assured may have the more readily permitted the rupture, it not having been shown that death would have ensued at the time it did but for the accident. The fact that a person of 50 or 55 years of age would be likely to have a normal hardening of the arteries in parts of the body, which might tend to bring about a rupture of the heart in case of a violent accident of the kind occurred in the instant case, is not sufficient to show that the accident was not the proximate cause of the death of the assured. If insurance is to be defeated because of the fact that the walls of the heart grow thinner by advancing years, or the arteries become sclerosed, or the valves of the heart act improperly, and this condition

is the result of age, then the collection of the insurance money may nearly always be defeated by the effect of increasing years, which change the condition of the assured. The court does not believe this to be the policy of the law.

Proof of Illegal Practice of Medicine

(Hathaway vs. State (Ga.), 81 S. E. R. 260)

The Court of Appeals of Georgia holds that, in a prosecution for practicing medicine illegally, the state is required to prove that the accused, with intent to receive compensation therefor, performed services such as are defined in Section 1683 of the Civil Code of 1910, without registering in the county of his residence as required by Section 1684. The burden is on the state to prove, as a material fact in the case, the residence of the accused as alleged in the indictment; but the prosecution may rely on the failure of the accused to attack prima facie or presumptive proof as to residence which is sufficiently strong to compel the production of affirmative proof in order to rebut it. The court says that, according to the record, the volume of practice done by the accused in this case was exceedingly small. He made a poultice from herbs, which he gathered in the suburbs of Atlanta, and applied it to the arm of the keeper of the hostelry where he was boarding, and he supplied one of the chambermaids with a bottle of "Klondike Kidney Cure," which appeared to have relieved her of a severe case of stomach-ache. The real point in this case was whether the services rendered by the accused were humanitarian on his part, and purely charitable, or whether they were performed with the intent to receive compensation. The evidence in favor of the prosecution on this point was weak and unsatisfactory, but it was sufficient to authorize a verdict of guilty, if the jury believed the witnesses for the state. The court does not think the jury would have been authorized to convict the accused on the complaint of the maid who had "awful" pains in her stomach, and who had her employer to pay the accused 50 cents for the medicine, which "did her good right away," for that showed nothing more than a sale of a patent nostrum. The testimony of the prosecuting witness, however, who, after detailing the services rendered and that he was benefited by the treatment, testified that: "He made some poultices and bandaged them on my arm, and gave me some pills, . . . and for his services we agreed that I should give him credit for \$2.50 on his board at my house, which I did. He took the \$2.50 on his board," came clearly under the terms of Section 1683 of the Civil Code, and there was positive uncontradicted testimony that the accused had not complied with the requirements of Section 1684. The evidence authorized the verdict of guilty.

Society Proceedings

COMING MEETINGS

- Amer. Academy of Ophthal. and Oto-Larynx, Boston, Oct. 19-21.
- Amer. Assn. of Obstetricians and Gynecologists, Buffalo, Sept. 15-17.
- American Association of Railway Surgeons, Chicago, Oct. 14-16.
- American Electro-Therapeutic Association, Battle Creek, Sept. 15-17.
- American Roentgen Ray Society, Cleveland, Sept. 9-12.
- Association of Military Surgeons of the U. S., Cincinnati, Sept. 29-Oct. 2.
- Colorado State Medical Society, Boulder, Sept. 8-10.
- Delaware State Medical Society, Wilmington, Oct. 13-14.
- Idaho State Medical Association, Boise, Oct. 8-9.
- Indiana State Medical Association, Lafayette, Sept. 24-25.
- Kentucky State Medical Association, Newport, Sept. 23-25.
- Med. Soc. of the Mo. Valley, Des Moines and Colfax, Ia., Sept. 17-19.
- Michigan State Medical Society, Lansing, Sept. 11-12.
- Minnesota State Medical Association, St. Paul, Sept. 30, Oct. 1-2.
- Mississippi Valley Med. Assn., Cincinnati, Oct. 27-29.
- Nevada State Medical Association, Reno, Oct. 13-15.
- New Mexico Medical Society, Albuquerque, Oct. 5-7.
- Oregon State Medical Association, Portland, Sept. 10-11.
- Pennsylvania State Medical Society, Pittsburgh, Sept. 21-24.
- Utah State Medical Association, Salt Lake City, Sept. 29-30.
- Vermont State Medical Society, Rutland, Oct. 8-9.
- Virginia Medical Society, Washington, D. C., Oct. 27-30.
- Washington State Medical Association, North Yakima, Sept. 21-23.
- Wisconsin State Medical Society, Oshkosh, Oct. 7-9.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal Diseases of Children

August, VIII, No. 2, pp. 113-184

- 1 Primary Pulmonary Actinomycosis in a Child Aged Ten, with Post-Mortem Examination. F. Huber and S. Berkowitz, New York.
- 2 *Casein in Infant-Feeding. A. W. Bosworth and H. I. Bowditch, Boston.
- 3 Presence of Lactic Acid in the Urine in Cyclic Vomiting of Childhood. F. P. Underhill and H. M. Steele, New Haven, Conn.
- 4 Clinical Study of Typhoid in Children. H. D. Chapin, New York.
- 5 *Diagnosis of Whooping-Cough by Complement-Deviation Test. A. Friedlander and E. A. Wagner, Cincinnati.
- 6 Artificial Cooling of Sick-Rooms. H. Heiman, New York.
- 7 *Circumcision in Masturbation of Female Infants; Report of Six Cases. R. G. Freeman, New York.
- 8 Middle-Ear Complications of Measles in Immigrant Children. H. C. Cody, Ellis Island, N. Y.
- 9 Case of Tuberculous Meningitis Complicated by Influenzal Meningitis. H. K. Faber, New York.
- 10 Active Immunization against Diphtheria by Means of Von Behring's Vaccine, and the Diphtheria Toxin Skin Reaction. B. S. Veeder, St. Louis.
- 11 Digestive Disturbances of Artificially Fed Babies. I. M. Snow, Buffalo.

2. Casein in Infant-Feeding.—A method is given by the authors for preparing dry powdered paracasein for use in infant-feeding. It is shown that this paracasein is very easily digested and absorbed, and judging from the elimination of creatinin and creatin, it seems possible to maintain normal nitrogen metabolism by its use in infant-feeding. It is shown further that disturbances (fever, toxic symptoms, etc.) do not result from feeding this paracasein in exceptionally large quantities for seven days, even if fed with only the small amount of whey carried in 68 c.c. of 32 per cent. cream.

5. Diagnosis of Whooping-Cough by Complement-Deviation Test.—The authors' results lead them to the opinion that the complement-deviation test is of the greatest possible value in the diagnosis at all stages. Eighteen cases tested during the paroxysmal stage gave positive reactions: 3 + in each case. Nine of the cases were in the first week of the cough and 3 early in the second week. In no case did a normal give a positive reaction. This series included several cases of bronchitis. Of the 12 early cases, tested in the catarrhal stage, 11 gave positive reactions, and in each instance the definite whoop appeared later, thus confirming the serologic diagnosis clinically. The one case that gave a negative reaction was tested at the very beginning of the cough. The sister had given a positive test. Two weeks later the child with the negative test began to whoop. The one case giving a positive test that never whooped, occurred in a child with paroxysmal cough and vomiting lasting over a period of four weeks, evidently an atypical pertussis. The technic of the test employed is described in detail.

7. Circumcision in Masturbation of Female Infants.—Freeman is convinced that the masturbation of female infants occurs in nervous children, the stimulating cause being adhesions about the clitoris such as exist in practically all female infants. The treatment of this condition by braces alone is palliative and not curative. The only curative treatment is by separation of the adhesions and circumcision, and the result of such operative interference is often satisfactory.

American Journal of Obstetrics and Diseases of Women and Children

August, LXX, No. 440, pp. 173-328

- 12 *Polypoid Chondrofibroma of the Fallopian Tube, Associated with Tubal Pregnancy. G. W. Outerbridge, Philadelphia.
- 13 Cesarean Section Necessitated by Pelvic Chondrosarcoma. D. Nathan, Norristown, Pa.
- 14 Pathogenesis and Differential Diagnosis of Perirenal Abscess Complicating the Post-Partum Period. C. G. Cumston, Geneva, Switzerland.
- 15 Plea for More Uniform Use of Murphy Button. J. W. Kennedy, Philadelphia.
- 16 Application of the Ninhydrin Reaction to the Urines and Urine Dialysates of Pregnant Women. L. Berman, New York.

one, and that, hygienically, the later children begin to read from books the better. The suggestion is made that little, if anything would be lost educationally by postponing the use of books in school at least until pupils have reached the age of 7. Oral instruction, wall-charts, blackboards, large pictures and other objects easily seen at a distance are recommended as substitutes for books in school.

The committee suggests a standard of book production, the adoption of which by educational authorities would render unprofitable the publication of books of a lower standard.

Among the hygienic requirements to which schoolbooks should conform the following are enumerated:

The surface of the paper should be neither glossy nor soft. The print of one side should not show through from the other, and the impression of the type on one side should not affect the evenness of the surface of the opposite side.

Books should be stitched with thread, so as to open flat. In books clipped from side to side with wire staples, the convex surface of the page gives rise to eye-strain.

For young children, illustrations from pen and ink drawings are preferable to halftones from photographs and wash drawings. The lettering of diagrams should be large enough to be read easily. Glazed paper may be used for halftone illustrations; it should never be employed for the text.

The ink should be a good black, and evenly distributed. The use of colored inks for reading-matter is strongly deprecated.

Worn stereotypes should be discarded. The ordinary text of schoolbooks intended for continuous reading should not be printed in double columns.

In regard to type faces, the committee expresses no preference between "modern" and "old style," but insists on a clean cut, well-defined type, neither too heavy nor too thin, not elongated vertically, and without excessive contrast between the finer and the heavier strokes. The general form of the letters should be broad and square, with a lateral shoulder on each type so that the letters are distinct. Long serifs should be avoided.

The size of type faces is considered the most important factor in the influence of books on vision. It is of the first importance to induce the young reader to keep a sufficient distance between eyes and book. Specimens of type faces considered acceptable for use at various ages are shown in the report. For children under 7, the smallest type presented has a minimum height of face for the short letters of 3.5 mm. (a little over $\frac{1}{8}$ inch). The use of type as small as that of the editorial pages of THE JOURNAL is not considered advisable for children under 12.

Very long lines of type necessitate great excursions of the eye and make it difficult to pass from one line to the next. Very short lines demand too frequent a change of direction in the movement of the eyes. A line of 4 inches for the largest type and $3\frac{1}{2}$ inches for the other sizes is recommended. Children 8 years old should not have their reading confined to very short paragraphs.

Good margins are restful to the eye and well worth their slight cost. The width of the outer edge in any schoolbook page should not be less than half an inch, and the width of the inner edge not less than three-eighths of an inch.

Copies of exercises, examples and questions produced by the hektograph or other multiplying process should be clear and legible.

It is better to multiply maps than to put much detail into one.

The Labeling Vice

Human vanity eyes all versatility with hostile suspicion. Most of us cannot do even one thing well, and we seldom have sportsmanship enough to applaud the man who excels at two or three. We prefer to label him with the first one of his achievements that attracts our notice. As for anything else he may do, we look it over and then firmly declare "None genuine without the original label."—R. H. Schauffler, *Century*.

Medicolegal

Death from Non-Abortive Anesthetic (*State vs. Tippie (Ohio)*, 105 N. E. R. 75)

The Supreme Court of Ohio holds that whoever, with the intent to procure the miscarriage of a woman by the use of an instrument or other means, administers to her a non-abortive drug as an anesthetic preparatory to the use of such instrument or other means of procuring an abortion, and the woman dies in consequence of the administering of such drug before the use of instruments or other means by such person to produce such miscarriage, and it does not appear that such contemplated miscarriage is necessary to preserve her life, or that the procuring of such miscarriage was advised by two physicians to be necessary for that purpose, is guilty of a violation of the provisions of Section 12412 of the Ohio General Code. Under such circumstances every act done and performed in furtherance of such unlawful purpose is an integral part of the whole unlawful transaction, and the fact that death ensues before the final act in the contemplated crime can be accomplished is not a defense to an indictment charging a violation of this section.

If it appears, however, that a non-abortive drug is administered to a woman as an anesthetic to enable a duly authorized and practicing physician fully and carefully to examine into the woman's actual condition for the purpose of determining if it be necessary to produce a miscarriage in order to save her life, and the woman dies from the effect of the drug so administered, and no miscarriage is produced, nor intended to be produced unless the examination discloses that it is necessary to preserve the woman's life, no offense has been committed within the provisions of Section 12412.

Evidence tending to show that no secrecy is maintained in the transaction, that a second physician is called in to administer the anesthetic, that while the woman is in a state of anesthesia the attending physician makes an examination for the purpose of determining whether the fetus is alive or dead, and on such examination does determine that the fetus is still alive, and that it is not necessary to procure a miscarriage in order to preserve the woman's life, and, having so determined, makes no use of any instrument or other means to procure a miscarriage, but immediately desists from further efforts in that direction, and directs that the woman be restored to consciousness, is proper evidence to be admitted for the purpose of showing the absence of criminal intent in administering the anesthetic.

Accident Deemed Cause of Death Notwithstanding Organic Weakness

(*Moon vs. Order of United Commercial Travelers of America (Neb.)*,
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The Supreme Court of Nebraska holds that it could be said that the death of the insured in this case was caused by external, bodily injury when, while going up the steps leading into his yard, he accidentally slipped and fell with force and violence, striking his external body near the region of the heart on a large stone with such force as to cause a rupture of the left auricle of his heart, from which he immediately died. The jury were warranted in finding that the accident was the proximate cause of the death, although the condition of the heart and other organs of the body of the assured may have the more readily permitted the rupture, it not having been shown that death would have ensued at the time it did but for the accident. The fact that a person of 50 or 55 years of age would be likely to have a normal hardening of the arteries in parts of the body, which might tend to bring about a rupture of the heart in case of a violent accident of the kind occurred in the instant case, is not sufficient to show that the accident was not the proximate cause of the death of the assured. If insurance is to be defeated because of the fact that the walls of the heart grow thinner by advancing years, or the arteries become sclerosed, or the valves of the heart act improperly, and this condition

27. **Ovarian Extirpation and Vasomotor Irritability.**—Hoskins and Wheelon found that ovarian extirpation in dogs results within six to eight weeks in a marked augmentation in the vasomotor reaction to a standard dose of nicotin. The reaction to epinephrin is not similarly increased. These results in conformity with clinical evidence indicate that the operations cause a heightened irritability in the sympathetic nervous system.

29. **Ultramicroscopic Clotting of Blood.**—Howell gives a description of the phenomena observed under the ultramicroscope when solutions of thrombin are added to oxalated blood-plasma or to solutions of fibrinogen. The essential point is that the fibrin formed is deposited not as a network but as separate well-formed needles of crystalline appearance which are massed to produce a mesh. Under certain conditions the process is incomplete, giving rise to the production of threads or rods of different lengths in place of the needles.

Bulletin Johns Hopkins Hospital, Baltimore

August, XXI, No. 282, pp. 228-254

- 30 *Significance of the Thymus in Exophthalmic Goiter. W. S. Halsted, Baltimore.
31 Summary of Studies of Loco-Weed Disease of Sheep. H. T. Marshall, Charlottesville, Va.
32 Behavior of Amelie Dysentery in Lower Animals and Its Bearing on the Interpretation of the Clinical Symptoms of the Disease in Man. W. A. Baetjer and A. W. Sellards, Baltimore.

30. **Thymus in Exophthalmic Goiter.**—It has been Halsted's practice of late in his strumectomy operations to investigate the contents of the space between the trachea and the manubrium with the object of determining the possible presence of an enlarged thymus. Only twice has he found it enlarged. The thymus symptoms predominated (attacks of dyspnea, diarrhea, no tachycardia, not much enlargement of the thyroid and not very definite eye symptoms). That the thymus plays an important part in Graves' disease, has been demonstrated beyond question by the results which have followed thymectomy. From the post-mortem examination of cases of exophthalmic goiter which have died of intercurrent disease it has been ascertained that the thymus gland is persistent in about 82 per cent. of them; and in those cases which have died of heart failure after operation enlargement has been found in about 95 per cent. At the Johns Hopkins Hospital there has been only one opportunity to make a necropsy on a patient with Graves' disease who died after operation. In this instance a long thick thymus gland was found tapering out from near the top of the manubrium sterni to the auricles of the heart.

From the facts gleaned at the autopsy table, from experiments on animals, and above all, from the results following primary thymectomies. Halsted has convincing evidence that the thymus gland may play an important part in exophthalmic goiter, and in some cases assume the title rôle. Some of the most puzzling features of the disease are made possible of interpretation by the discovery of the influence which the thymus may exert. Primary thymectomies uncomplicated by strumectomy and secondary thymectomies in cases not sufficiently relieved by resection of both lobes of the thyroid, Halsted says, would be the operations of choice for those searching for the essence of the Basedow symptoms. The combined operation would be avoided by them as much as possible until it became more definitely known how profoundly and in what particulars the thymus may influence disease.

California State Journal of Medicine, San Francisco

August, XII, No. 8, pp. 303-356

- 33 Study and Prevention of Tuberculosis. R. A. Peers, Colfax.
34 Id. G. E. Tucker, Riverside.
35 Earliest Manifestations of Tuberculosis and Treatment. G. E. Enright, San Francisco.
36 Why Are Better Results Not Being Obtained in the Prevention and Treatment of Tuberculosis? F. M. Pottenger, Monrovia.
37 Some Laboratory Aids in Diagnosis of Tuberculosis. G. H. Evans, San Francisco.
38 Prognosis of Pulmonary Tuberculosis. W. R. P. Clark, San Francisco.
39 Treatment of Pulmonary Hemorrhage. R. S. Cummins, Los Angeles.

- 40 Bureau of Tuberculosis, Its Work and Plans. B. F. Howard, Sacramento.
41 Arequipa Sanatorium; Sociologic and Economic Experiment in Care of Tuberculous Wage-Earning Girls. P. K. Brown, San Francisco.
42 Social Insurance in Its Relation to Tuberculosis. J. N. Force, Berkeley.
43 Induced Pneumothorax. E. von Adelung, Oakland.
44 Diagnosis, Significance and Treatment of Bronchial Lymph-Nodes in Infancy and Childhood. W. P. Lucas, San Francisco.
45 Indication for Labyrinth Operation, with Report of Eight Cases Not Operated. C. F. Welty, San Francisco.
46 Uterine Replacement with Particular Attention to Buteau Suspension. C. A. Dukes, Oakland.
47 Butterfield and Green's Treatment of Three Cases of Grave Secondary Anemia. J. Jackson, Pasadena.
48 Dangers of Vaginal Examinations during Labor. A. Miller, Porterville.
49 Intraspinal Treatment of Tabes. Preliminary Report. S. J. Gardner, W. B. Coffey and W. T. Cummins, San Francisco.

Canadian Medical Association Journal, Toronto

August, IV, No. 8, pp. 661-756

- 50 Relation of Theory and Practice in Operative Treatment of Genital Prolapse. H. Jellott, Dublin, Ireland.
51 Surgical Teaching. R. Morison, Newcastle-upon-Tyne.
52 Infant Mortality. A. Brown and G. Campbell, Toronto.
53 *Cardiac Hypertrophy. T. F. Cotton, Montreal.

53. **Cardiac Hypertrophy.**—One hundred and fifty hypertrophied hearts were examined by Cotton. Of the kidney cases the greater number were of the interstitial type with hypertension and cardiac enlargement. In all the increase in weight of the whole heart was constant; the values of the relative weights of the ventricles, however, varied within wide limits. In some there was a marked hypertrophy of the left ventricle, in a few right hypertrophy predominated, while in many the normal relationship of the two ventricles was maintained. Microscopic sections showed myocardial degeneration in many; this was difficult to establish in a few. Cotton suggests that the altered state of the heart muscle may play an important rôle in the development of hypertrophy in the different chambers of the heart, while in many cases of hypertrophy associated with aortic valve lesions the hypertrophy was borne by the left ventricle. Cotton not uncommonly found a general hypertrophy, and in some a right hypertrophy, and this distribution seemed to bear no relation to the severity of the valvular lesion. He believes that here, undoubtedly, the back flow of blood during diastole into the left ventricle must increase the work of that chamber, and will explain in part the resulting hypertrophy.

Cotton would not look on the valvular defect as the essential factor in the production of the hypertrophy. If so, he says one should expect to find in those hearts with a general or right-sided hypertrophy, a greater incompetency of the aortic valves. In his case he did not observe any difference in the valvular lesions corresponding with the hypertrophy present. He did, however, note that a greater or less degree of muscular degeneration was generally present. Therefore, he would, as in renal cases, look on the degenerated myocardium as playing an important rôle in the development of the hypertrophy. In those hearts with mitral insufficiency, hypertrophy of the left ventricle was not a constant finding. In the majority of hearts hypertrophy was more developed in the left chamber, but in many the hypertrophy was general, the relative weights of the two ventricles being within normal limits, while in a few hypertrophy of the right ventricle predominated.

Only in one group of cases did Cotton's results corroborate the back pressure theory as an explanation of the hypertrophy associated with valvular lesions. In those hearts with mitral stenosis uncomplicated by any other valvular lesion, he found in every instance hypertrophy of the right ventricle predominating. Of those hearts with degeneration of the myocardium but with the valves quite intact, where the leaking or narrowed valve could not be a factor in embarrassing the heart's action, the results in the main corresponded with renal hearts. The hypertrophy was oftener of the left ventricle, not uncommonly the whole heart was increased in size, and occasionally the ratio of the ventricular weights was below 1.77, which he found to be normal.

Delaware State Medical Journal, Wilmington

June, V, No. 7, pp. 1-26

- 54 Appendicitis Mistaken for Right Pyosalpinx. H. J. Stubbs, Wilmington.

Illinois Medical Journal, Chicago

August, XXVI, No. 2, pp. 77-152

- 55 Relation of Precordial Pain to Heart Disease. J. M. Patton, Chicago.
- 56 *Some Psychic Factors of Surgical Anesthesia. R. H. Ferguson, East Orange, N. J.
- 57 Case of Tumor of Hypophysis with Operation. E. Hill, Chicago.
- 58 Problem of the Stammering Child. E. L. Kenyon, Chicago.
- 59 Radium; Some of Its Uses in Skin Diseases. F. E. Simpson, Chicago.
- 60 Experience with Milk Sickness. A. J. Clay, Hoopston, Ill.
- 61 Imperforate Anus; Report of Two Cases. M. H. Smith, Sherrard, Ill.
- 62 Further Advancement in Studies of Syphilis. B. C. Corbus, Chicago.
- 63 Bone Transplantation for Cure of Tuberculous Spine Disease, with Report of Cases. C. M. Jacobs, Chicago.
- 64 *Specific Treatment of Hay-Fever by Active Immunization. K. K. Koessler, Chicago.
- 65 A Booster Sermon. C. W. Carter, Clinton, Ill.

56. **Psychic Factors of Surgical Anesthesia.**—Ferguson considers in detail the psychic phenomena of patients awaiting anesthesia and which the successful anesthetist must have clearly before him. Except under certain special circumstances, he does not believe in controlling the mind of the patient by drugs. He says it is always best to guide or subdue psychic phenomena by psychical technic. The endeavor of the anesthetist should be to have his patient believe that he knows his business and that he has perfect confidence in his patient taking the ether well. The method should be by action not words. Keep from the senses of the patient to be anesthetized anything and everything that could disturb him or impress on him undesirable ideas. Everything, even to the most trivial circumstances should make for tranquility of mind, and the leaving of pleasing impressions on the sensorium of the patient. If perfect trust in the anesthetist is wanting the patient will try to control the induction, thereby disturbing it, particularly when coordination of the senses is wanting. This negative condition, a lack of confidence, becomes positive distrust if anything that may be interpreted as deception occurs and early in the induction the patient antagonizes the anesthetist. Ferguson discusses all phases of this subject in detail.

As to the preliminary use of morphin, Ferguson objects to it because patients differ so in their idiosyncrasy to morphin that a correct dose is difficult to determine. It does away with the anesthetist's two most important waymarks, the character of the respiration and the light reflexes of the pupils. Unless administered in undue quantity, morphin prolongs the induction and necessitates more ether to be used, since it diminishes both the number of respirations per minute and the amount of tidal air at each respiration. Morphin prevents the patient clearing the larynx if necessary. Morphin favors sudden respiratory arrest with a slow, intermittent respiration after it has been restored. Morphin favors postoperative nausea and vomiting. Morphin may allow asphyxia during recovery. The three classes of case in which Ferguson demands its use are these: 1. Nervous cases with marked physical manifestations. 2. Pronounced alcoholics. 3. Young or middle-aged men of a marked athletic type or build.

64. **Specific Treatment of Hay-Fever by Active Immunization.**—In the last four years Koessler had treated 41 hay-fever patients by active immunization with pollen extracts, made by his method. Five of these had the early spring variety of the disease, and all these began treatment after the disease was already developed. The remaining 36 had the disease was already developed. The remaining 36 had autumnal catarrh. Seventeen of these patients had prophylactic treatment, whereas, 19 were treated while symptoms of hay-fever were present. Four of these patients had been completely free from hay-fever, though remaining in their usual place of abode. Of these 4 patients, 3 had treatment during two years, and one during three years—for two to three months. The supreme test in patients who are apparently free from the disease, is a railway or an automobile

journey through flowering fields. Only these 4 patients of the 41 could stand this experiment; 2 of them have so far remained free for two years, and 2 for one year. Of the other 37 patients, 29 were markedly improved subjectively as well as objectively. The remaining 8 are considered objectively not improved, though 5 of them feel subjectively benefited. The marked improvement consists in later, milder and shorter attacks, in the possibility of remaining in town and at work for the first time in years, in a diminution or disappearance of troublesome cough and constitutional symptoms. Twenty-three of the 41 patients had previous asthmatic attacks during the day and night in the critical season. Of these 16 experienced an undoubted amelioration of this most distressing feature of the disease. Six of these hay-fever asthmatics had no asthmatic symptoms, though 5 of them still retained other symptoms of hay-fever. Others had only 2 or 3 attacks during the whole season, were little disturbed in their sleep during the night, while emphasizing the improvement experienced.

Indiana State Medical Association Journal, Fort Wayne

August, VII, No. 8, pp. 357-396

- 66 Local Manifestations in Ear, Nose and Throat, Associated with Disease of Nervous System. J. D. Heitger, Bedford.
- 67 Stricture of Male Urethra. F. G. McCarthy, Terre Haute.
- 68 Tinted (Light Gray) Operating-Rooms. J. R. Eastman, Indianapolis.
- 69 Early Diagnosis of Ruptured Ectopic Pregnancy. C. Sudranski, Greencastle.

Journal of Experimental Medicine, Lancaster, Pa.

August, XX, No. 2, pp. 93-200

- 70 *Studies in Experimental Atherosclerosis. I. Adler, New York.
- 71 *Relation of Spleen to Blood Destruction and Regeneration and to Hemolytic Jaundice. Supposed Regulatory Influence of Spleen in Formation and Destruction of Erythrocytes. E. B. Krumbhaar and J. H. Musser, Jr., Philadelphia.
- 72 *Id. Influence of Spleen on Iron Metabolism. J. H. Austin and R. M. Pearce, Philadelphia.
- 73 Effect of Variation in Osmotic Tension and of Dilution of Culture Media on Cell Proliferation of Connective Tissue. A. H. Ebeling, New York.
- 74 *Cultivation of Human Sarcomatous Tissue in Vitro. J. R. Loose and A. H. Ebeling, New York.
- 75 *Removal of Calcium from Blood by Dialysis in Study of Tetany. W. G. MacCallum, R. A. Lambert and K. M. Vogel, New York.
- 76 Experimental Production of Necrosis of Liver in Guinea-Pig. M. S. Fleischer and L. Loeb, St. Louis.
- 77 *Effect of Intravenous Injection of Substances Affecting Tumor Growth on Cyclic Changes in Ovaries and Placentomata. M. S. Fleischer and L. Loeb, St. Louis.
- 78 *Circulation of Kidneys Following Ligation of One Ureter. A. A. Ghoreyeb, Boston.

70. **Experimental Atherosclerosis.**—Although he does not arrive at any definite conclusions as the result of his experiments, Adler states, that in all probability the theory which bases atherosclerosis on a purely mechanical etiology will not prove tenable. Whether mechanical factors come into play at all, and if so, to what extent, remains to be seen. It seems almost certain, at least in our present state of knowledge, that chemical influences, subject possibly to more or less nerve control are dominant factors in the etiology of atherosclerosis. Perhaps it may be discovered also that cholesterolin and its various modifications and combinations, while undoubtedly an element of importance in atherosclerosis of the rabbit and human beings, may not be the sole predominant etiologic factor. If it should turn out that so simple a procedure as adding a certain proportion of hydrochloric acid to the food of dogs is sufficient to produce lesions of the blood-vessels closely analogous, if not wholly identical with human atherosclerosis, a revision of our present theories will become necessary.

71. **Spleen, Blood-Destruction and Regeneration, Hemolytic Jaundice.**—Krumbhaar and Musser conclude that the slight differences between the arterial and venous blood of the spleen are within the limits of error inherent in the methods of blood examination and are not be explained by a peculiar action of the spleen. In some instances peculiarities shown by the splenic venous blood are common to the venous blood of the general circulation. Banti and Furno's observation concerning the presence of free hemoglobin in the blood of the splenic vein is not confirmed.

They also found that fresh extracts of spleen are devoid of definite hemolytic action. Occasional trivial and irregular results, not to be explained, are found, but these occur likewise in the control extracts of liver and mesenteric lymph-nodes. Twenty-four-hour extracts prepared at low temperature, show little or no increase in hemolytic activity. Boiled splenic tissue, extracted in the cold for twenty-four hours, is inert.

Intraperitoneal injection of saline extracts of fresh spleen constantly causes a sharp increase in red cell count and hemoglobin content. The rise is evanescent, lasting but one or two days, and may be followed by an equally evanescent drop below normal. Similarly prepared extracts from other organs fail to give this rise. No noteworthy change is found in the resistance of the red blood-cells to hypotonic salt solution, or in the number of skinned or reticulated erythrocytes, after the injections of the various organ extracts. A temporary increase of polymorphonuclear and transitional leukocytes usually follows the use of spleen extract, but may occur also, though less frequently, after the injection of liver and kidney. The constant increase of red cells in the peripheral circulation after injection of spleen, in view of the tendency to anemia following splenectomy, suggests that the spleen normally may exert a stimulating effect on the formation of red cells in the bone-marrow. The feeding of fresh raw spleen to splenectomized dogs has no clearly defined influence in preventing the anemia which usually occurs after splenectomy.

72. Influence of Spleen on Iron Metabolism.—Austin and Pearce's studies give evidence of increase in the iron elimination in three of five dogs during a period of two weeks following splenectomy, but not in two other dogs. The occasional increased output of iron may have some relation to the anemia which occurs in the early weeks after splenectomy and which varies in degree in different animals. No evidence was secured of an increase in the iron output at one, nine and twenty months after splenectomy. From their own studies and from examination of the literature of the subject the authors conclude that the spleen does not exercise a constant and important influence on the iron metabolism of the body.

74. Cultivation of Human Sarcomatous Tissue in Vitro.—Two experiments were made by Losee and Ebeling in which fragments from human sarcomatous tissue were cultivated. It was possible to keep cultures of such tissue in a condition of active life *in vitro* for several generations. One culture was stained which was growing actively in its twelfth passage (twenty-one days). One other culture was carried through for twenty-four passages, that is, fifty-two days. It was possible to divide this culture in its fifteenth passage, making two, and after forty-eight hours incubation one of these cultures was fixed. Sarcomatous tissue grew as well during a few days as normal connective tissue. Afterward the rate of growth became less rapid and the tissue could not be kept alive for more than fifty-two days, while normal human tissue could be kept for sixty-eight days.

75. Removal of Calcium from Blood.—It was found by the authors that one may devise a fluid containing practically all the inorganic diffusible constituents of the blood except calcium, and use it to dialyze normal blood in such a way as to remove from it a large part of its calcium. The dialyzed blood when perfused through an isolated extremity produces an extreme hyperexcitability of the nerves quite like that observed in tetany. Since perfusion with blood of the same composition, but containing calcium in the proportion found in the normal blood, causes no hyperexcitability of the nerves it is evident that the hyperexcitability is due to the lack of calcium. This effect can be attained in only a slight degree by replacing the blood of a whole animal with the dialyzed blood, since under the conditions of the experiment the tissues cannot be sufficiently depleted of their calcium. It seems probable that the parathyroid secretion is not removed by dialysis, but is returned to the body with the dialyzed blood.

To bring this result into relation with the condition in tetany following parathyroidectomy, animals in tetany were bled and the blood was replaced in one case with normal blood, in the other with dialyzed blood poor in calcium. The normal blood immediately relieves the tetany and lowers the excitability, while the dialyzed blood does not. The authors believe, therefore, that this is a further proof that in the tetany of parathyroidectomy also the twitching and hyperexcitability of the nerves is due to lack of calcium in the blood and tissues.

77. Intravenous Injection, Tumor Growth and Cyclic Changes in Ovaries.—If six to seven days after copulation incisions are made under ether anesthesia into the uterus, and on the day following this operation one or several injections of hirudin are given, Fleisher and Loeb noted that changes set in the ovaries which correspond to those found at the time of ovulation; namely, a degeneration of all the follicles with the exception of the small ones. These degenerative changes are followed by the same developmental changes as in the normal cycle. This represents a second method of altering experimentally the periodicity of the sexual cycle, the first consisting in the early extirpation of the corpora lutea.

Under the same conditions intravenous injections of hirudin destroy, in the large majority of cases, the greater part of experimental placentomata through hemorrhages, and they prevent the remaining placentomatous areas from active proliferation. These injections may also cause abortion in pregnant animals. Intravenous injections at various places in the circulation, probably as a result of interference with the a tendency to hemorrhage at various places in the body, and these hemorrhages are prone to occur, especially in rapidly growing tissues, in which the blood-vessels are less resistant, as in tumors and in placentomata, also in the neighborhood of necrotic areas. In the stomach the hemorrhages may be followed by digestion of the tissues through the gastric juice. It is probable that there is a connection between the action of hirudin on the blood (coagulability and viscosity) and the tendency to hemorrhage. Withdrawal of blood, intravenous injections of distilled water, colloidal copper, nucleoproteid, or casein have no marked effect on the cyclic changes in the ovaries or on placentomata.

78. Circulation of Kidneys Following Ligation of Ureter.—During the first week following ligation of one ureter there is found an impediment to circulation which is removed on opening the distended pelvis and reducing the intrapelvic pressure. This impediment, therefore, is probably due to the compression of the blood-vessels within the kidney brought by dilated tubules and unyielding capsule, and also possibly to disturbance of circulation produced by the distention of the pelvis. The venous and arterial branches passing over this may be either compressed or in various ways distorted. During this period the anemia produced by the impediment together with pressure and other factors gives rise to changes in kidney tissues which reveal themselves microscopically as a swelling and degeneration of one ureter there is an impediment to the circulation other than due to intrapelvic pressure. This impediment is probably due to cicatricial changes in the organ, which tend to maintain the tubules dilated and in a position of encroachment on the space normally allotted to blood-vessels, and which manifest themselves microscopically as a connective tissue cell infiltration into the interstitial tissues of the kidney, and an increase in vascular cells of the tufts diminishing the caliber of the tuft capillaries. The increased amount of work thrown on the control kidney produces no lesions other than a hypertrophy, which permits a greater and more rapid circulation through its vascular system.

Kentucky Medical Journal, Bowling Green
August 1, XII, No. 14, pp. 453-474
79 Acute Dysentery. F. M. Sherman, Lewisport.
80 Our Armor-Plate. E. D. Burnett, Anchorage.
81 Medical Progress in the Past Thirty Years. R. Lockhart, Owensboro.
82 Medical Doxology. J. A. Freeman, Crestwood.

- 83 Cancer of the Breast, with Particular Reference to Certain Phases of Diagnosis. N. Evans, Murray.
84 Uncinariasis. J. A. Frantz, Russell.
85 Gonorrheal Arthritis and Tenosynovitis; Report of Two Cases. S. E. Vidt, Russell.

Missouri State Medical Association Journal, St. Louis
July, XI, No. 1, pp. 1-60

- 86 Prevention Rather than Cure. E. H. Miller, Liberty.
87 Professional Reminiscences and Plea for Medical Unity. T. F. Lockwood, Butler.
88 Practical Points for General Practitioner Compelled to do Eye-Work. J. W. Charles, St. Louis.
89 Medical Libraries. R. E. Schlueter, St. Louis.
90 History of Missouri Medical College, from 1840 to 1861. A. B. Barbee, St. Louis.
91 House-Fly. S. Lambeth, Verona.

August, No. 2, pp. 61-112

- 92 Dispensary Treatment of Diabetes Mellitus. R. H. McBaine, St. Louis.
93 Medical Legislation. C. P. Emerson, Indianapolis.
94 Congenito-Mechanical Dilatation of Colon. F. W. Bailey, St. Louis.
95 Early Recognition of Clinical Significance of Gastric Disturbance. A. J. McNees, Clinton.
96 Cervical Ribs. C. Potter, St. Joseph.
97 Case of Renal Calculus. G. D. McCall, Fulton.
98 Some Chemical and Germicidal Properties of Antiseptics and Disinfectants. R. Cross, Kansas City.
99 Splenectomy and Right-Sided Nephropexy Simultaneously. W. F. Grinstead, Cairo, Ill.
100 Pellagra in City Hospital. A. H. Fortner, St. Louis.
101 Advisability of Prematrimonial Medical Examination from Standpoint of Woman. M. H. McLean, St. Louis.

New Jersey State Medical Society Journal, Orange

August, XI, No. 8, pp. 379-430

- 102 Conservation of Child Life. M. J. Synnott, Montclair.
103 Infancy of Migraine and Arteriosclerosis. D. E. English, Summit.
104 Treatment of Pertussis. C. H. Finke, Jersey City.

New York Medical Journal, New York

August 15, C. No. 7, pp. 301-348

- 105 National Quarantine. L. E. Cofer, Washington, D. C.
106 Value of Skimmed Milk and Its Dilution in Fever. L. Fischer, New York.
107 Effects of Caffeine and Nicotin on the Activity of the Intestinal Musculature. W. A. Frankland, Washington, D. C.
108 Campaign against Pulmonary Tuberculosis. A. Robin, Wilmington, Del.
109 Value of Renal Functional Tests to the Surgeon and the Limitations of These Tests. J. T. Geraghty, Baltimore.
110 Pyloric and Duodenal Obstruction. F. Buckmaster, Effingham, Ill.
111 Further Development of the Usefulness of the Sanatorium. C. B. Shade, New York.
112 Treatment of Diabetes Mellitus with Bacillus Bulgaricus. P. Horowitz, New York.
113 Sputum Trap for Lung Examinations. G. E. Barnes, Herkimer, N. Y.

Surgery, Gynecology and Obstetrics, Chicago

August, XIX, No. 2, pp. 131-300

- 114 Fractures Near Joints. H. M. Sherman. Fractures into Joints. H. M. Sherman and D. Tait, San Francisco.
115 Tumors of Neck. F. E. McKenty, Montreal.
116 Case of Common Ileocolic Mesentery with Torsion. C. Tage-Hansen, Copenhagen, Denmark.
117 Tuberculosis of Kidney: with Special Reference to Its Diagnosis. G. E. MacKlem, Detroit.
118 *Operative Treatment of Aneurysm of Aorta. H. Kümmell, Hamburg-Eppendorf, Germany.
119 Essential Dysmenorrhea. T. J. Doederlein, Chicago.
120 Calcified Fibroma Uteri Compressing Sigmoid Colon. G. de Tarnowsky, Chicago.
121 Traumatic Periosteal Bone and Callus Formation. O. J. Fay, Des Moines, Iowa.
122 Infraction of Second Metatarsal Bone. Report of Six Cases. A. H. Freiberg, Cincinnati.
123 Congenital Contractures of Fingers. Report of Case of Familial Type. H. Neuhoef and E. D. Oppenheimer, New York.
124 Modern War Surgery. R. J. Behan, Pittsburgh.
125 *Contractured Psoas Parvus Tendons. Report of Two Cases. T. L. MacDonald, Washington, D. C.
126 Sarcoma of Round Ligament of Uterus. F. J. Taussig, St. Louis.
127 *Repair of Accidental Injuries to Rectum. C. G. Heyd, New York.
128 Technic of Intrathoracic Operations. A. Carrel, New York.
129 Avulsion of Scalp. A. A. Law, Minneapolis.
130 Anterior Cholechojejunostomy. Report of Case. R. H. Jackson, Madison, Wis.
131 *New Method of Circumcision. W. L. Thornton, Birmingham, Ala.
132 Further Development of an Apparatus for Transfusion of Blood. H. S. Satterlee and R. S. Hooker, New York.
133 *Use of Pituitary Extract in Labor. D. G. Madill and R. M. Allan, Dublin.
134 *Axillary Sup. G. S. Foster, Manchester, N. H.

118. Operative Treatment of Aneurism of Aorta.—The plan of operation adopted by Kümmell in one case cited was to lay bare the aorta as much as possible retroperitoneally and retroperitoneally, and after compressing it to remove the sac and close the opening in the artery by suture. Therefore several ribs (the fourth to sixth) were resected at the spinal column, care being taken to spare the pleura, and a large enough opening produced in the wall of the thorax so that the hand could easily be inserted. The pleura, which was somewhat thickened, was not injured, so that it was not necessary to use the positive-pressure apparatus that was held in readiness. The pleura was pushed forward and the thoracic aorta laid bare without difficulty as far as the sac of the aneurism, which was found to lie above the diaphragm.

A rubber tube was laid under the thoracic aorta in order, if necessary, to utilize it for a temporary closing of the artery. Kümmell did not have to use it, but produced the necessary compression with the fingers. The thoracic aorta was compressed between the thumb and index finger of an assistant at the diaphragm and the upper boundary of the pulsating tumor that was now covered only with a thin skin; the sac of the aneurism was laid bare with a long incision, the tear which was already present enlarged, and masses of clot removed. In order to be able to see the lower part of the normal aorta at the edge of the sac, Kümmell split the diaphragm and laid bare the upper part of the abdominal aorta retroperitoneally, so that there was a free view of the field of operation, including the thoracic and abdominal aorta and the sac of the aneurism. The sac of the aneurism was larger than the fist and the original tear in it was 10 cm. long. Kümmell passed his index finger into the normal lumen of the aorta above and below the aneurism from the inside of the sac and trimmed the latter so that a vessel corresponding to the normal lumen of the aorta was formed. The aneurism had caused a bulging chiefly of the posterior wall of the aorta, and had left the part of the artery lying immediately behind the spinal column comparatively unaffected. The 10-cm.-long slit in the new-formed aorta, that was now freely exposed, was closed with a continuous suture and the digital pressure somewhat relaxed. As a little blood still emerged from some places, a second continuous suture was applied over the other without any special difficulty. During the compression the blood-pressure had risen to double its normal height from the exclusion of the greater part of the circulation.

The digital compression of the aorta had lasted about twelve minutes. As it was gradually relaxed and finally withdrawn altogether, the suture was found to be sufficient. Not a drop of blood exuded from the line of suture. The pulsation in both femorals was strong and the pulse in the dorsalis pedis could be distinctly felt. The operation had taken about an hour, and after its completion the patient was in comparatively good condition, which is attributed to the fact that he was anesthetized by the intravenous administration of ether, and the heart was kept strong by the continuous influx of salt solution and ether. But he gradually grew weaker and weaker, and finally died of heart failure.

125. Contractured Psoas Parvus Tendons.—In the cases of moderate contracture, McDonald says, complete thigh extension may be possible but painful. Restriction is definite. In the suppurative cases of appendicitis the contractured tendon may readily be overlooked because of the importance of terminating the operation at the earliest moment, of indulging in the least possible intra-abdominal manipulation, and because bowel and omental adhesions supervene. The cardboard-like edge of the shortened tendon is capable of damming—to a most troublesome degree—the cecal current, the relief of constipation after tenotomy being quite noteworthy, even while the patient is lying in bed. At present the stripping up of the peritoneum from the outer edge of the abdominal wound, as though to expose the ureter, seems satisfactory and feasible for exposing the tendon for tenotomy, when the abdomen is opened through the oblique incision. Prompt relief to the symptoms may be expected

after complete tenotomy. In the postoperative cases the leaning attitude of the patient may well suggest adhesions. The persistence of thigh flexion under anesthesia is characteristic. McDonald's patients were inclined to be neurotic.

127. Repair of Accidental Injuries of Rectum.—A colon tube is introduced into the anus and passed up the rectum to a point 1 inch above the injury. Through the anterior rectal wall and the portion of tube above the injury a transfixion suture of number two chromic gut is passed which firmly anchors the tube to the upper portion of the anterior wall. The peritoneum on each side of the defect and parallel with the rectum is incised for a distance of about two and a half inches. By this maneuver the upper rectum becomes mobilized, after the manner of Kocher for mobilizing the duodenum. By gentle traction on the tube protruding through the anus the two lips of the rectal defect are brought together and approximated by three or four interrupted mattress sutures.

Two Allis clamps, one on each side, are placed about one-half to three-fourths inch below the suture line for the purpose of fixing the lower segment. Traction is made on the tube and as a result the upper segment of the anterior rectal wall is "telescoped" into the lower rectal segment. There is thus produced an artificial intussusception of the anterior rectal wall. The original defect or injury is carried down into the lower bowel and by the rolling in of the anterior rectal wall a peritoneal approximation is assured. A right-angle Cushing suture of Pagenstecher thread is passed along the site of peritoneal contact, completing the repair of the rectum. The lateral peritoneal defects are closed and the tube sutured to the anal margin with silkworm gut, thereby making gentle but firm traction on the upper rectal segment.

131. New Method of Circumcision.—In Thornton's method the prepuce is slit dorsally between two artery clamps. By passing a fine needle, threaded with silk, through the skin and around the superficial vessels they may be lightly ligated near the line of incision. The ventral margin of the prepuce is grasped by a clamp. At intervals of about three-sixteenths of an inch, number nine milliners' needles threaded with fine black silk are placed through mucosa and skin in a line around the penis about one-fourth inch from the corona of glans penis. The redundant prepuce is removed by cutting with scissors around the line marked by the needles. Each suture is then drawn through and tied. Since all incised tissues are included in the sutures, hemorrhage should be controlled when sutures are tied. However, if there should be a bleeding point, an additional suture is placed.

This method of circumcision is said to have the following advantages: The line of incision in skin and mucosa is accurately marked off and held in place by the needles, preventing unevenness and loss of bearings. Complete hemostasis. Prevention of retraction of subcutaneous tissues. Prevention of dead space and subsequent hematoma. Prevention of exposure of subcutaneous tissue to infection. Less traumatism. Less pain and priapism following operation.

133. Use of Pituitary Extract in Labor.—Madill and Allan report the results of 147 cases, studied at the Rotunda Hospital. They found pituitary extract undoubtedly increases the strength of the uterine contractions. These strengthened contractions maintained their physiologic character. The best results were obtained when given during the second stage. Its use reduced the number of forceps operations, with consequent lessening of morbidity in these cases. It is safe for the mother, and at least as safe as forceps for the child. It gives improved results for both mother and fetus in cases of placenta praevia, if used in combination with version. The puerperium is normal.

134. Axillary Sup.—Under this title Foster describes Lane's method of giving free fluid to the support of the circulatory system. He reports his observations on fifty cases of general surgery. The fluid used is normal saline solution which is placed in a reservoir to which is connected a "Y" rubber tube with glass connections. The single tube of

this "Y" is sufficiently long to permit it to be coiled within a porcelain enamel basin filled with hot water kept at 110 degrees. The saline solution is also poured into the reservoir at this same temperature. Such an arrangement allows of a drop of from five degrees to ten degrees before reaching the hypodermoclysis needles. The reservoir is placed at a proper elevation so that sufficient column pressure is exerted to easily force the saline into the subcutaneous tissues. The hypodermoclysis needles are always kept very sharp that they may pierce the skin with ease. They are three inches long, with the lumen large enough to permit a free stream of the fluid.

After the patient is fully under the anesthetic the chest is laid bare. A section of the skin area just inside of the external border of the pectoralis major muscle over its most prominent part and above the mammary gland is cleansed with antiseptic soap. The suds is then wiped away and the skin perfectly dried with sterile gauze. This skin area is then painted with full-strength tincture of iodine. While the fluid is running the needles are introduced piercing the pectoralis muscle in a direction outward and slightly tilted downward until the needle point is seen to push the loose skin of the axilla before it. The point is then moved about slightly to make sure it is properly situated and free. The amount of fluid supped during any operation depends on the time consumed in operating. No case has supped less than 40 ounces and some cases have taken as high as 140 ounces during an operation. The average operation on an average sized individual will require between 75 and 90 ounces. At the completion of the operation the needles are withdrawn and the skin apertures sealed with collodion and sterile cotton.

Tennessee State Medical Association Journal, Nashville

August, VII, No. 4, pp. 143-186

- 135 Suggestions for Change in State Law Concerning Expert Testimony. S. T. Rucker, Memphis.
- 136 Bone Transplantation. Report of Cases. E. T. Newell, Chattanooga.
- 137 Pistol Wounds of Brain. Report of Two Cases. J. L. Crook, Jackson.
- 138 Necessity of Wassermann Reaction in Controlling Treatment of Syphilis. H. Spitz, Nashville.
- 139 Pneumonia. A. D. Walker, Friendship.
- 140 Pain in Abdomen. E. W. Mabry, Gainesboro.
- 141 School Hygiene. T. J. Coble, Shelbyville.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

August, XI, No. 128, pp. 337-384

- 1 *Auricular Flutter in Acute Rheumatic Carditis. G. A. Sutherland.
- 2 Familial Case of Splenomegalic Anemia with Infantilism. F. P. Weber.
- 3 *Associated Movement of Jaw and Upper Lid: Jaw-Winking Phenomenon. D. A. Cockayne.

1. Auricular Flutter in Acute Rheumatic Carditis.—Auricular flutter is often latent and unsuspected. As practical points for further investigation Sutherland suggests that attention be paid to the following possible indications of the presence of this abnormal form of rhythm: (1) Attacks of cardiac asthma (great dyspnea) occurring suddenly and without accompanying variations in the cardiac condition. In one case cited by Sutherland, there were two such attacks preceding the acute illness, and they were at the time diagnosed as asthmatic in origin. (2) A triple or galloping or cantering rhythm heard on auscultation. In two cases cited there was a triple rhythm present, heard both at the apex and in the neck. In Dr. Morison's case of jugulo-embryocardia, which was the first example of auricular flutter recorded, each auricular contraction was audible in the right supraclavicular region, the auricular rate being 240, while the ventricular was 114. (3) Pericarditis without effusion and with great respiratory distress. The inflammatory changes in pericarditis are usually earlier and more marked about the

auricles than the ventricles, and a disturbed auricular rhythm may follow from the active effusion in and around the auricular walls. (4) Dyspnea, cyanosis and enlargement of the liver out of proportion to the physical signs of disease of the heart. (5) The presence of the pulsus alternans. Further investigations will be required to determine whether in cases of acute carditis a disordered rhythm of this nature is often present.

3. Associated Movement of the Jaw and Upper Lid.—Cockayne's case occurred in a baby girl first seen at 6 months of age. The movements were first noticed when she was about a month old. The right eyelid went up and down as the baby sucked at the breast. The baby was fat and healthy looking, but there was a slight ptosis of the right upper lid, such that the lid fell as low as the level of the upper edge of the pupil. As far as one can tell in so young a baby, voluntary movement of the levator was good, and also of the other ocular muscles. The pupils were equal and reacted to light; there was no facial asymmetry, and no difference in size of the tarsal plates. As the baby sucked the right lid was raised synchronously with the movements of the jaw so that a little sclerotic was shown each time above the right cornea. As the jaw was moved away from the side of the lesion, as in grinding the teeth, the lid was raised. An almost imperceptible lateral movement was sufficient. The left lid was not moved, and the right eye itself remained stationary. Slight sucking movements produced no movement of the lid. When the baby yawned or laughed the lid was retracted to an extreme degree and showed a large extent of sclerotic. The movements are diminishing in frequency and in extent. There is no history of a similar condition or of ptosis in the family.

British Medical Journal, London

August 8, 11, No. 2797, pp. 277-320

- 4 Vis Medicatrix Naturae. J. A. Thomson.
- 5 The Responsibility of the State in Connection with Venereal Disease. A. K. Chalmers.
- 6 Public Measures Against Venereal Disease in Denmark. E. Pontoppidan and L. McIlroy.
- 7 Essential Preventives of Prostitution. L. Grant.
- 8 State Medical Service vs. A Panel System. J. Collicie, H. H. Mills, R. C. Buist and M. Dewar.

Dublin Journal of Medical Sciences

August, No. 512, pp. 81-156

- 9 Clinical Value of Staining Urinary Deposits. E. S. Johnson.
- 10 Clinical Report of Rotunda Hospital for One Year, Nov. 1, 1912, to Oct. 31, 1913. H. Jellett, D. G. Madill and R. M. Allan.
- 11 Two Cases of Pseudo-Hypertrophic Muscular Dystrophy. A. F. B. Shaw.

Edinburgh Medical Journal

August, XIII, No. 2, pp. 97-192

- 12 New Route of Inquiry as to Nature and Establishment of Typical Sex-Ensemble in Mammalia. H. D. B. Hart.
- 13 Anaphylaxis and Status Lymphaticus; Their Relation to Intensified Types of Disease in Infancy and Childhood. H. C. McNeil.
- 14 Habit as Pathological Factor. A. J. Brock.
- 15 Intratracheal Insufflation of Ether. H. T. Thompson.
- 16 Roentgen Ray and Bismuth Meal Method as an Aid in Diagnosis of Some Alimentary Diseases. E. Price.

The Glasgow Medical Journal

August, LXXXII, pp. 81-160

- 17 Gangrenous Appendicitis with Coprolith, Abscess, Septic Peritonitis, Intestinal Obstruction, Rupture of Intestine, and Fistula: Complete Recovery. S. Mort.
- 18 The Western Medical School, Glasgow. J. N. Morton.

Lancet, London

August 8, 11, No. 4745, pp. 359-434

- 19 Cancer of the Uterus. Charles Ryall.
- 20 Nature of Peritoneal Adhesions. Arthur Keith.
- 21 Osteo-Arthritis of the Hip; Diagnosis in Its Early or Preosteophytic Stages. R. L. J. Llewellyn.
- 22 After-Care of the Consumptive. H. W. McConnell.
- 23 Treatment of Yaws by Intravenous and Intramuscular Injections of Neosalvarsan and Salvarsan. P. Harper.
- 24 Pneumosan in the Treatment of Pulmonary Tuberculosis. A. E. Carver.

21. Osteo-Arthritis of the Hip.—Llewellyn and Jones comment on the extreme slowness with which the condition of

osteo-arthritis of the hip is established and emphasize the extreme length of time that may elapse before bony outgrowths can be detected. From their consideration, therefore, of the clinical features, supplemented by the results of roentgenography, they are led to postulate two stages in the life history of osteo-arthritis: 1. A primary or preosteophytic phase, often of prolonged duration, whose clinical characteristics are those of villous hypertrophy. 2. A secondary or terminal stage in which bony and cartilaginous outgrowths make their appearance.

Their presumption as to the villous nature of the disorder is based on the occurrence of attacks of pain with pseudo-locking sensations which come and go in the same erratic fashion that we are familiar with in the case of the knee. In addition, too, there is in some instances accessory evidence in the shape of villous overgrowths in the knees, which, of course, in this articulation are more easy of detection by palpation. In support of their contention the authors remark that if in so-called osteo-arthritis of the knees roentgenography be resorted to after routine fashion the same absence of bony outgrowths will be ascertained with striking frequency save in the more advanced cases. They are led, therefore, to the conclusion that this condition of osteo-arthritis, whether of the hip or knee, is invariably preceded by a long period during which the only local signs and symptoms clinically appreciable are those of villous hypertrophy. In other words, the villous overgrowths being more obtrusive mask as it were the early beginnings of fibrillation in the diseased cartilage.

Diagnosis of osteo-arthritis of the hip in its terminal stages presents no difficulty, but unfortunately at this period in its life history treatment is of little avail. The authors therefore urge that in all cases of so-called sciatica investigation of the movements of the hip should invariably be undertaken, for during the early or preosteophytic phases of the disease there is good reason to believe that the march of the morbid process may be arrested if care be taken to remove any sources of strain on the affected articulation. They indicate the importance of a reduction of body-weight if obese, as undue corpulence is undoubtedly an aggravating factor. Coincidentally any static deformity in the lower limb, whether in the direction of flat-foot or possibly inequality in length of extremities, either congenital or acquired—viz., shortening from malunited fracture—should, as far as possible, be corrected so as to diminish any mechanical strain. For the diseased joint itself, when painful or irritable, absolute or relative fixation by some form of ensheathing apparatus is indicated pending the decline of acute symptoms. It should be discarded only during the night and reapplied in the morning after massage, passive movements, and hyperemia or hydrotherapy, with or without thermal douches or hot-air applications, have been practiced.

Practitioner, London

August, XCIII, No. 2, pp. 157-300

- 25 *Rigor. F. Taylor.
- 26 *Leukoplakia. A. E. Barker.
- 27 Dislocations of the Hip. E. M. Corner.
- 28 Nearthrosis in Ankylosis. A. H. Tubby.
- 29 Intermittent Pulse. B. T. P. Smith.
- 30 Review of Tropical Diseases. R. T. Hewlett.
- 31 *Ringworm of Scalp and Beard. D. Freshwater.
- 32 Treatment of Rodent Ulcer by Roentgen Ray. C. Kempster.
- 33 *Advantages of Intubation of Larynx over Tracheotomy in Laryngeal Diphtheria. W. S. Thomson.
- 34 Treatment of Diphtheria. J. J. Jervis and V. C. Martyn.
- 35 Cystic Hygroma. L. C. Panting.
- 36 Perforation of Bladder from Chronic Ulceration, with Secondary Appendicitis. J. B. Pike.

25. Rigor.—Occurring in the course of apparent health, if there is no psychical disturbance, Taylor says, rigors suggest the onset of acute illness, as pneumonia or influenza; occurring in the course of a local inflammation, they suggest suppuration; occurring in the course of an apparently general infection, they suggest, but are by no means conclusive of local foci of suppuration. Their occurrence in typhoid fever, and in some cases of malignant endocarditis, shows that the

suppuration need not be there. In cases of gall-stone and renal calculus they are incidental, and have no significance other than that they point to the presence of a source of irritation. They may coincide in time with the maximum of obstruction, which just precedes the final passage of the stone to the type of individual is highly probable. The relation of a rigor is purely symptomatic.

26. **Leukoplakia.**—Barker urges that every patch of this affection should be watched closely, especially if it does not improve under treatment. On the slightest sign of activity in it, free excision should not be deferred. The first sign of cancerous change in such a patch is usually seen in the more advanced degrees. It generally begins as a crack in the white covering or at its ragged border. This fissure exudes blood or serum, and causes pain on movement of the part. It may break under washes, but in any case must be under suspicion whether it does or not. There is usually a feeling of stiffness in the area affected. It has lost its softness and indurated; then the crack deepens and widens, and the pain and discomfort increase. On finding this induration around a crack in an old leukoplakia there should be no hesitation in resorting to free local excision. The state of the glands carcinoma starting in leukoplakia has little tendency to spread along the lymphatics; that it is one of those forms of cancer which remain for a considerable time purely a local disease. On the whole it appears to Barker that the very pessimistic views held in some quarters, as to the inevitable transition of leukoplakia into carcinoma, have perhaps been overdone. It is a condition to be watched carefully, and one which justly excites uneasiness; but it is another thing to take it for granted that it is always the precursor of cancer, and to attack it at once by wide-reaching excision of the part itself and of the glands likely to be involved.

31. **Ringworm of Scalp and Beard.**—There are two main methods for the treatment of ringworm: 1. Old method, by means of the local application of a parasiticide. 2. New method, by Roentgen rays. Old method.—The hair should be cut as short as possible for at least 2 inches around the infected area. A better plan is to shave the head all over. The head should be washed daily with green soft soap, or an antiseptic shampoo wash, such as,

R Thymolis	.....	gm. or c.c.	
Saponis mollis	.....	1	or gr. xv
Sp. Vini. Rect.	.....	30	3 i

This is allowed to remain some ten to fifteen minutes on the scalp before rinsing off. The hair around the edges of a patch, for at least 1 inch should be pulled out; this prevents spreading by continuity. A good ointment to apply before and during the period of epilation, is

R Cupri Oleatis	.....	gm. or c.c.	
Hydrarg. Oleatis	.....	4	3 i
Lanolini	.....	1/66	gr. xxv
Ol. Olivae	.....	30	3 i

The following prescriptions Freshwater has proved to be efficacious, and, he says, if persevered with, will ultimately lead to a cure:

R Acid Salicylic	.....	gm. or c.c.	
Sulphur. Praecip.	.....	2	or gr. x
Adipis	.....	30	gr. xxx
Fiat ung.	.....		3 i
R Sulphur	.....	gm. or c.c.	
Acid. Salicylic	.....	4	3 i
Naphthol.	.....	66	gr. x
Hydrarg. Ammon.	.....	30	3 i
Lanolini	.....		3 i
Paraffin Liq.	.....		3 ss
Fiat ung.	.....		3 iii
R Sulphur	.....	gm. or c.c.	
Acid. Carboli	.....	2	or 3 i
Lanolini	.....	20	3 ss
Paraffin Liq.	.....	12	3 iii
Fiat ung.	.....		

The following lotions are also serviceable:

R Formalin, 40 per cent.	.....	gm. or c.c.	
Aquam	.....	8	3 ii
R Acid. Salicylic	.....	30	3 i
Spt. Lavand.	.....	2	or gr. xxx
R Acid. Sulphurous	.....	30	3 ii (fresh)
Aquae	.....	8	5 vi
R Acid. Picric.	.....	24	gr. viii
Camphor.	.....	120	3 iv
Sp. Vini. Rect.	.....	180	3 vi

The lotion should be applied with a brush twice daily for a month, when in favorable cases the stumps will have fallen. In small chronic patches and in the small widely spread patches of a disseminated ringworm, the application of croton oil is a valuable form of treatment. It is best combined with phenol (carbolic acid) or creosote.

Phenolis (Acidi Carbol)	.....	1	Creosoti	.....	3 ii
Ol. Croton	.....	9	Ol. Croton	.....	3 vi
R Acid. Salicylici	.....	gm. or c.c.			
Ol. Lavandulae	.....	66			gr. x
Ol. Bergamoti	.....	30			m v
Ol. Olivae	.....	30			3 i

Since the introduction of the treatment by means of epilation by Roentgen rays, the cure, even in obstinate cases, has been shortened to a few weeks.

33. **Intubation in Laryngeal Diphtheria.**—Thomson considers that intubation is the better operation because, in the great majority of cases, it is much more easily performed than tracheotomy, no preliminary preparation is needed; no anesthetic is required, skilled assistance is not essential; as there is no cutting, and no subsequent scar, the consent of the parents is readily obtained, the operation can be very rapidly performed, even with the patient in bed, and without good sufficiency of air to enter. If dyspnea is not relieved, no harm is done. Tracheotomy can then be performed. The after-care, so important in tracheotomy, is a simple matter.

Annales de Médecine, Paris

- March, 1, No. 3, pp. 253-352
- 37 The Milk Question in Human Tuberculosis. (Rôle de la tuberculose bovine dans la contamination de l'homme.) A. Calmette.
- 38 Experimental Research on Transfusion of Blood. E. Bardier and D. Clermont.
- 39 *Test Induced Diuresis with Abnormally High Blood-Pressure. (Epreuve de la diurèse provoquée chez les sujets atteints d'hypertension artérielle.) J. Cottet.
- 40 Reinfection with Tuberculosis. E. Rist, M. L. Kindberg and J. Rolland.
- 41 The Fundamental Clinical Forms of Diabetes. F. Rathery.
- 42 The Luetin Reaction. E. Joltrain.
- April, No. 4, pp. 353-468
- 43 Modification of the Circulation in Course of Cirrhosis with Ascites. A. Chaffard and D. Routier.
- 44 *Lesions of the Thyroid with Basedow's Disease. G. Roussy and J. Clunet.
- 45 Sleeping Sickness. (Etude clinique de la trypanosomiase humaine africaine.) H. Darré.

39. **Test Diuresis with High Blood-Pressure.**—Cottet expatiates on the clinical importance of induced polyuria, viz., the diuresis which follows drinking a pint (600 c.c.) of a mild mineral water in the morning, fasting, and on the clinical importance of the proportion between the amount of urine voided during the night and the day. The normal portion is about $\frac{1}{2}$. He regards this "rhythm" of the proportional output day and night as of great diagnostic value. Other conditions being equal, this rhythm persists unmodified in the individual case; the amount of urine may vary widely at different times, but the proportion keeps up unchanged. Good effects from a course of mineral waters are possible only when the induced diuresis test shows that the way through the kidneys is open. With a high blood-pressure, neglect to ascertain this may lead to great harm from a course of mineral waters. Persons with arteriosclerosis and kidney disease often drink unusually large amounts of fluids, hoping thus to "wash out the system." If the kidneys are

below par this excess of fluids is not eliminated properly and it gorges the vessels and may do direct mechanical injury. Cottet cites Janeway's statement that 79 of 100 patients with high blood-pressure died with symptoms suggesting chronic kidney disease. Impending uremia is a superposed danger with high blood-pressure, and unless it can be warded off the prognosis is grave indeed. Tests for induced polyuria throw light on the conditions. The special features of the technic and findings of the test were given in *THE JOURNAL*, 1913, ix, 90.

44. **Lesions of the Thyroid Gland in Exophthalmic Goiter.**—Roussy and Clunet give an illustrated description of the changes they found constantly in the thyroid gland in twelve cases of exophthalmic goiter and never in ordinary goiter or in mere thyroiditis. These lesions are so characteristic, they say, that microscopic examination of a single scrap will serve to differentiate the disease without further data. The changes found suggest that drugs to combat infection, sodium salicylate, quinin, arsenic, mercury, may be useful at first. When the lesions are once established, palliative organotherapy or removal of the thyroid or thymus is indicated unless radiotherapy is given the preference. This acts more like a gradual natural process, and has the advantage that it acts on both thymus and thyroid.

Annales de Médecine et Chirurgie Infantiles, Paris

July 15, XVIII, No. 14, pp. 465-500

- 46 The Luetin Reaction Less Reliable than the Wassermann in Inherited Syphilis. G. Blechmann, M. Delort and A. Tulasne.
- 47 *Meningeal Complications of Scarlet Fever. P. Mauriac and P. Philip.
- 48 Blue Disease with Negative Auscultation. (Cyanose congénitale.) M. Grandjean.

47. Already summarized in *THE JOURNAL*, Aug. 22, p. 710.

Archives des Maladies du Cœur, etc., Paris

August, VII, No. 8, pp. 497-560

- 49 *Certain Varieties of Pulsus Alternans. (Variétés du pouls pseudo-alternant. Couples extrasystoliques et alternance. Changement de sens spontanés de l'alternance.) L. Gallavardin and L. Gravier.
- 50 Technic for Dissection of the Heart to Avoid Injury of Node and Bundle of His. (Techniques autoptiques du cœur.) S. Argaud.
- 51 *Hematology of Scorbutus in the Adult. J. Heitz.

49. **False Pulsus Alternans.**—Gallavardin and Gravier expatiate on the remarkable light thrown on pulsus alternans by electrocardiography. It has shown that pulsus alternans is produced sometimes by the respiratory movements alone or by extrasystoles. This of course does not have the clinical significance of true pulsus alternans. He gives tracings from a case of false pulsus alternans from what he calls auricular bigeminism and another due to "extrasystolic trigeminism"—both exceptional cases. The tracings from another patient show two or three weak systoles occasionally in the midst of an apparently regular pulsus alternans. This spontaneously upsets the regular alternation. He encountered this in only one case out of fifty examined with electrocardiography and it did not recur during the later examinations in this case. When it happens that the respiration-rate is exactly one-half of the heart-beat, the tracing shows that each second peak is lower than the first; this regular depression of every second peak runs through the tracing unless the breath is held during a few heart-beats. When the respiration is thus shut off, the peaks run regularly at the same height.

51. **The Blood in Scorbutus in Adults.**—Heitz tabulates the blood-findings in a woman who developed scorbutus after prolonged errors in diet. They confirm the findings of the Japanese in thirty-five Russians taken at the fall of Port Arthur, De Albertini's in ten Italians and those of Austregislo at Rio de Janeiro in thirteen insane persons with scorbutus. The blood-picture does not seem to be much modified by the scorbutus; there is merely a tendency to

anemia, with whites somewhat below normal and slight polynucleosis.

Journal de Médecine de Bordeaux

July 26, LXXXV, No. 30, pp. 501-514

- 52 *Large Trapezoidal Resection of Knee Contracted at Acute Angli (Ankylose osseuse complète tibio-fémoro-rotulienne.) H. L. Rocher.
- 53 Habits of Ducks Render Duck Eggs More Liable to Infection Than Hens' Eggs. (Toxicité des œufs de cane.) P. Carles.

52. **Correction of Crippled Knee.**—The stiff knee formed an angle of 55 degrees, but by cutting the tibia and femur nearly straight across, the limb was straightened with merely a shortening of 7 cm.

Presse Médicale, Paris

July 22, XXII, No. 58, pp. 557-564

- 54 *Radium as Supplement to Operative Treatment of Cancer. (La radiumthérapie métachirurgicale.) F. Jayle.

July 29, No. 60, pp. 577-584

- 55 *Acute Osteomyelitis of Upper Jaw in the New-Born. A. Broca.
- 56 Determination of Albumin Content of Urine by Aufrecht's and Tsuchiya's Technics. V. P. Semionov.

54. **Radium as Adjuvant to Operations for Cancer.**—Jayle reports two cases of extensive malignant disease of both ovaries or the uterine cervix in women of 32 and 33 in which he applied radium treatment at once after radical operation and there has been no sign of further trouble during the five and a half and three years since. These were among the first gynecologic cases in which radium was applied. He cites further two cases from Desjardins' service in which over five and three years have elapsed without signs of further trouble although the operative removal of the organs involved was far from complete. In a recent case an absolutely inoperable cervix cancer was modified by seventy hours' exposure to 11 cg. radium sulphate so that it could be safely removed.

55. **Acute Osteomyelitis of the Jaw in the New-Born.**—Broca describes a couple of typical cases of acute osteomyelitis in the upper jaw in quite young infants. He has encountered ten such cases in the hospital and one private case and five died. The swelling and inflammation start in the upper jaw but spread so rapidly to involve the orbit that the trouble is often mistaken for ophthalmia. The bloody-purulent nasal discharge and the signs of severe intrabuccal inflammation and fistulas soon clear up the diagnosis. This is facilitated by the non-involvement of the upper lid in the process and by the serous character of the conjunctival secretion and absence of gonococci. Erysipelas may be suspected at first but the intrabuccal swelling and fistulas and the involvement of the three surfaces of the upper jaw soon render erysipelas less probable. The osteomyelitis in these cases affects the germinal tissue of the two temporary molars. He thinks it is of blood-borne origin, from some general infection, possibly traceable to the umbilicus. The osteomyelitis was installed by the third day after birth in one of his cases, and in Fürst's case a bloody purulent nasal discharge was noted by the eighth day. Nine of his eleven little patients were boy babies.

The septic reaction varies within a wide range and the outcome depends in large measure on the promptness with which the abscess is incised and the posterior portion of the jaw scraped out, bringing away the germinal tissue involved. If there is a suborbital fistula he cures and drains between the skin and the vestibule of the mouth. The child must not nurse for a few days; it is better to draw the breast milk and feed it to the infant. He generally operates under a little chloroform if he deems any anesthetic necessary. In one case the trouble kept up until after a few months a sequester was curetted out. The osteomyelitis of the upper jaw is less tenacious than when the lower jaw is involved. Healing, once started, proceeds rapidly but the destruction of the germinal tissue of the teeth may affect dentition, and it is irreparable.

Berliner klinische Wochenschrift

July 27, LI, No. 30, pp. 1307-1444

- 57 *Defective Respiration in Children. (Manifeste und latente Insuffizienz der Expiration im Kindesalter.) F. Göppert.
58 *Morbid Dread of Blushing. (Ereuthrophobie.) M. Bernhardt.
59 *Sterilization of Vaccines, etc., by Ultraviolet Rays. III. E. Friedberger.
60 Identical Serologic Findings in Twins. (Serologisches Verhalten eines Paares einiiger Zwillinge.) F. Schiff.
61 Auxo-Action of the Serum. (Auxowirkungen und gebundene Aminosäuren des Blutserums.) M. Jacoby and N. Umeda.
62 *Recovery after Removal of Large Brain Tumor. (Heilung eines bemerkenswerten Grosshirntumors.) W. Alexander and E. Unger.
63 *Friedmann's Treatment for Tuberculosis. (Wissenschaftliche Vorstudien und Grundlagen zum Friedmannschen Mittel.) F. F. Friedmann.
64 *Early Diagnosis of Pulmonary Tuberculosis. E. Stern.

57. **Insufficiency of Expiration in Children.**—Göppert calls attention to a group of cases among children with a chronic or recurring cough in which the lower margin of the lungs is found continuously below the normal level, although neither the clinical manifestations nor the auscultation findings suggest this. By pressing on the ribs to aid in expiration the diaphragm rises to the normal level, showing that there is no mechanical obstacle to normal expiration. The children thus affected are generally of the pronounced exudative diathesis type, that is, with an inborn predisposition to chronic swelling of mucous membranes. Lichtwitz has noticed a similar tendency to insufficient expiration in young adults with constitutional eczema. The cause is probably some impediment in breathing which is overcome in inspiration but hinders expiration, probably some congestion and catarrhal secretions plus possibly a tendency to spasm of the bronchi. A tendency to catarrhal oversecretion plus congenital subnormal elasticity of the lung tissues are probably the main factors involved.

The deficient expiration is fraught with various dangers and must be combated. This can be done only by training the muscles to expel the breath effectually. Even children of 4 or 5 can exercise the muscles in this way, taking a short breath and expelling it slowly and emptying the lungs. Under these exercises extra quantities of sputum are expelled, and frequently a previously intractable cough may be cured by this means. This confirms the existence of catarrhal conditions and shows that such persons are particularly prone to emphysema, etc., and should be watched over with special care. He has the exercises repeated two or three times a day, three deep-expirations and then a pause of two or three minutes, repeating this three or four times. At first the expiration must be aided by compression of the chest from the rear by the hands of an adult, also impeding inspiration.

58. **Abnormal Fear of Blushing.**—Bernhardt gives the confessions of two men who suffered so intensely from a tendency to blush on the slightest excuse that one even spoke of suicide. Both were evidently the prey of neurasthenia and were psychopathic. Treatment in such cases, he says, must be mainly psychic, possibly with hypnosis, as adjuvant to drugs to steady the unstable nervous system and physical measures to tone it up in general.

59. **Sterilization by Ultraviolet Rays; Especially after Spraying with Stain.**—Friedberger's further research, he states, has confirmed his previous announcement that vaccine can be sterilized in thirty minutes, without impairing its potency, by exposure to the ultraviolet rays. He also reports tests of the influence of these rays on amoebae, complement and antigen separately. Bacteria in urine and blood seem to be protected against the ultraviolet rays unless sensitized by 1 to 100,000 or 1 to 1,000,000 eosin solution. This same favoring influence from eosin sensitization was observed also in experimental infection of the interior of the mouth treated by exposure to the ultraviolet rays or direct sunlight. The bacteria in the mouth were killed off so promptly and constantly that he thinks this method of radiotherapy after sensitization with a stain offers an encouraging prospect for treatment of throat affections in human beings and to sterilize bacillus-carriers. During the exposures he

sprayed the region repeatedly with the eosin or fuchsin 1 to 100,000 solution.

62. **Recovery after Removal of Brain Tumor.**—Alexander and Unger report a case of a large encapsulated tumor in the upper half of the posterior central convolution removed at one sitting under local anesthesia with complete recovery for the six months to date. At the age of 22 the previously healthy young man began to have epileptic seizures but the aura was usually long enough to permit him to stuff a handkerchief in his mouth to protect his tongue. He was under specialist medical care for four years and not until after this interval did symptoms develop pointing to a brain tumor. Even then the symptoms were mild in comparison to the size of the tumor; it was shown up well by the Roentgen rays. It extended into the lateral ventricle and the only defect left from its removal is a pure stereognosis, that is, loss of power to recognize objects by touch. Otherwise there seems to be complete recovery. The tumor must have grown very slowly and it already showed signs of calcification when exposed. The young man was conscious during the entire operation, even for a whole minute during which respiration was arrested, but he suffered no pain. A photograph shows the excised tumor implanted in a brain taken from a cadaver.

63. **Friedmann's Remedy for Tuberculosis.**—Friedmann devotes nearly nine pages to his description of his preliminary experimental work and the bases for his method of treating tuberculosis. He reaffirms that it should be used as a protecting vaccine for children in a tuberculous environment, and reiterates that its harmlessness for man is shown by the case-histories that have been reported.

64. **Early Diagnosis of Pulmonary Tuberculosis.**—Stern emphasizes the importance from this standpoint of a tendency to anemia, dyspepsia, diarrhea, tachycardia, especially paroxysmal tachycardia, and slight enlargement of the heart dulness toward the right; also pains in the shoulder or abdomen may suggest primary or secondary pleurisy of tuberculous origin. Another significant finding is a paresis of the vocal cord on the side of the lung lesion, associated with slight chronic laryngitis. He calls this the larynx sign of early pulmonary tuberculosis and advises direct visual inspection to detect it when there is a sensation of vague oppression in the chest, a tendency to rheumatic pains, slightly irregular breathing, or dyspepsia. The entrance to the throat is moderately red and the paralyzed vocal cord is also red. There is always more phlegm on the paretic cord than on the other, and its inner margin is usually irregular in outline. There is slight hoarseness, particularly at night, and the patient hawks often but raises very little sputum and tubercle bacilli cannot be found at this early stage. As the pulmonary process progresses or subsides, the throat findings become modified to correspond.

The pupil of the eye on the side affected is often more dilated than the other and the reaction to light is more sluggish. The musculature on this side is often less well developed, but this is not a consequence of but merely a predisposing factor to the tuberculous focus. The lagging behind of one-half of the chest in the excursion of the thorax is a sign of trouble within, usually involving the pleura. Nearly all the foregoing symptoms can be traced to pressure on nerves by enlarged bronchial lymph-glands. By heeding these signs we can recognize the tuberculosis even before the lung has become involved in the process to any extent.

Deutsche Zeitschrift für Chirurgie, Leipzig

June, CXXX, Nos. 1-2, pp. 1-224

- 65 *Meningitis After Subcutaneous Injuries of the Skull and Spine; Two Cases with Recovery. F. Markull.
66 *Operative Treatment of Wandering Kidney. H. Tichy.
67 *Primary Round-Cell Sarcoma in Both Kidneys in Girl of 8. H. Schwens and A. Wagner.
68 *Fibrous Ostitis by Intra-Uterine Fracture. E. Stierlin.
69 *Crushing of the Wrist. (Der Kompressionsbruch und die traumatische Erweichung des Mondbeines.) G. Guye.
70 *Operative and Mechanical Treatment of Pulmonary Tuberculosis. (Die 1911 und 1912 mit der Wilmshausen Pfeilerresektion behandelten Lungentuberculosen.) A. Meisel.

the streptococcus-pneumococcus group has helped to a better understanding of the changing pathogenic specificity of these bacteria. Apparently transmutation of a strain of this group may occur in the focus of infection. The oxygen supply of the tissues about the focus seems to be an important factor in the transmutation of the micro-organism. In consequence it may take on characteristics which render it pathologically specific in the infection systematically of joint-tissues or of muscles including the myocardium, or of tendons and aponeuroses or of endocardium and pericardium or of gall-bladder or of mucosa of stomach and intestine or of pancreas, or of kidney, respectively. Apparently strains with an affinity for joint-tissues and muscles, or for joint-tissues, endocardium and pericardium may develop in the primary focus. Inoculations with strains obtained from patients suffering from chronic arthritis, rheumatic fever, with endocarditis and pericarditis, myositis, peptic ulcer (surgically excised), cholecystitis (surgically operated), chronic infectious endocarditis (blood-culture), have resulted in the production of the respective lesions in the experimental animal. The interesting experiments proving the transmutation of the streptococcus-pneumococcus group by Rosenow,⁴ and the positive results obtained by him in making cultures by new and ingenious methods, from tissues and exudates, in the various diseases named, have made clear many clinically obscure conditions. The transmutation of the strains in growth and specific pathologic characteristics explains, too, the varying and often contradictory results of various research workers in inoculation experimentation with animals.

METHOD OF SYSTEMIC INFECTION AND RESULTING MORBID ANATOMY

Probably the infective agent passes from the focus to other tissues through the blood-stream. Histologic examination of joint structures, heart-valves, muscles and other tissues of inoculated animals shows embolic bacterial masses in the terminal arteries. Endothelial proliferation at the site of the embolus closes the vessel lumen. Muscle and joint-capsule show embolism, local hemorrhage and endothelial proliferation closing the lumen of the vessels. The same process takes place locally in the submucosa of the stomach and intestine and of the fundus of the gall-bladder. Anemic necrosis and rupture into the gall-bladder is a cause of cholecystitis, acute or chronic, and if the latter, gall-stones may form. The specific streptococcus may invade vessels of the pancreas. Acute severe pancreatitis may result, or a lesser degree of infection may so diminish the blood-supply of the organ as to disturb its function, and temporary or severe glycosuria supervenes. Lessened nutrition and oxygen of the infected tissues due to the mode of infection bring about characteristic results. The anatomic changes in capsule, cartilage and bone of joints, in muscles, tendons and aponeuroses which are characteristic of chronic arthritis may be produced by ligation of some of the nutrient arteries of joints, muscles, etc. (Oxhausen⁵). Furthermore, the strains of streptococci which apparently cause chronic deforming arthritis and myositis grow best in a low oxygen tension and even grow anaerobically. The method by which they invade the tissues produces a condition of

the tissues in which they thrive. The peculiar characteristics of the mode of infection, the diminished blood-supply to the tissues, the resulting morbid anatomic change and the suitable mediums for continued viability and growth of the infectious agent, explain, in part at least, the progressive nature and the difficulty of successful management of arthritis deformans.

A characteristic directly opposite of this is evident in chronic infectious endocarditis due to the *Streptococcus viridans*. Here the infection is undoubtedly hematogenous. The scar of healed endocarditis and valvulitis is often predisposing. This infectious agent grows best in a high oxygen content. The circulating blood furnishes this in abundance. It causes an abundant vegetative growth on the valves and endocardium. In this nidus, swimming in oxygen it multiplies, becomes immunized against the host and resists every method of treatment.

Acute rheumatic fever is of undoubted focal origin. The newer methods of bacterial culture (Rosenow⁴) have proved the presence, usually, of the infectious organism in the joint-fluid, and it may always be found in the synovial membrane and proximal lymph-nodes during the height of the disease. The strain of the streptococcus which produces these acute lesions also has an affinity for the endocardium and pericardium and often for the myocardium and some groups of the skeletal muscles. Apparently the micro-organism has other affinities. One of the clinical group (Woodyatt) called attention to an apparent thyroiditis in some of the patients suffering with acute rheumatic fever. The thyroid gland was palpably enlarged and tender on palpation. There was moderate tachycardia, tremor of fingers, unusual nervousness, excessive sweats and diminished carbohydrate tolerance. Of five patients then in wards, suffering with acute rheumatism, three showed this evidence.

CASE 1.—A. X., man, aged 35, married, porter, Greek, admitted, April 1, 1914. Diagnosis: Rheumatism, acute; tonsillitis acute; thyroiditis. Complaint: March 30, 1914, illness began with soreness of throat, chilliness, pain in lumbar muscles and left heel and swelling and much pain in knees. Profuse sweats at night. Anorexia, thirst and constipation. Had rheumatic fever in 1900 and several minor attacks since then. Examination: Well-nourished; teeth good; tongue, slight whitish fur; tonsils very large, red and infected; thyroid, palpably enlarged and tender; heart and lungs normal; spleen palpable; knee-joints hypersensitive but not swollen; profuse sweating; fine tremor of fingers; temperature from 102 to 104 F.; pulse 90 to 100; blood-pressure 125 systolic; blood, reds 4,440,000, whites 13,500, hemoglobin 70 per cent.; urine scant, 1,028, acid, albumin trace, casts 0. April 2, 7 a. m., glucose, 50 gm., given before breakfast. Urine voided and examined each hour. Glucose present only in specimen voided at 9 a. m. Treatment: Compound pills of rhubarb, as necessary; sodium salicylate and bicarbonate 1 gm. every three hours; oil of wintergreen and bandages applied to joints. April 18, discharged, recovered. Tonsillectomy advised and refused. April 19, readmitted for slight recrudescence. No joint-swelling and no fever. April 22, discharged; tonsillectomy refused. May 30, readmitted for tonsillectomy. Cultures from depths of tissue of excised tonsils yielded almost pure cultures of a green-producing streptococcus.

CASE 2.—P. K., man, aged 25, single, laborer, Greek, admitted, April 12, 1914. Diagnosis: Rheumatism acute; endocarditis; thyroiditis; tonsillitis acute. Complaint: Acute inflammation of many joints; began nine weeks ago with sore throat, fever, sweats, etc. In Francis Willard Hospital two weeks. Apparent recovery. Recrudescence three weeks ago with sore throat, pleurodynia and polyarthritis. Denies venereal disease. Examination: Well-nourished; sweating and

5. Oxhausen, G.: Ueber Einfache aseptische Knochen und Korpelnkrose, Chondritis desiccans und Arthritis deformans, Verhandl. d. deutsch. Gesellsch. f. Chir., Berlin, 1912, xlii, Part 1, p. 40, Part 2, p. 446.

hypersensitive skin; tonsils large, red and infected; teeth negative; thyroid gland palpable, enlarged and lobes tender to touch; heart, left border, dullness 13 cm.; systolic murmur at mitral area; second pulmonic tone accentuated; rate 100 to 110; many points swollen, hypersensitive and painful to movement; fine tremor of hands; fever, remittent 99 to 101 F. Reds 5,260,000, whites 10,300, hemoglobin 70 per cent; blood-pressure 135 to 145 systolic; urine scant, 1,022, acid, albumin 0, sugar 0, casts 0. April 14, 50 gm. glucose given before breakfast at 7 a. m. At 8 a. m. urine=sugar 0. At 9 a. m. urine=sugar present. At 10 a. m. urine=sugar 0. Treatment: Cleansing mouth- and throat-washes; sodium salicylate and bicarbonate each 1.3 gm. every three hours; oil of wintergreen and compresses of cotton applied to joints. April 17, joints still swollen and painful. Fine tremor of fingers, systolic murmur at mitral area. April 29, convalescent. Tonsils reduced in size and no visible infection. Thyroid gland comparatively smaller and not sensitive to palpation. Systolic murmur at mitral area. May 5, discharged recovered. Tonsillectomy advised.

CASE 3.—P. X., man aged 27, single, laborer, Greek, admitted, May 10, 1914. Diagnosis: Rheumatism acute; tonsillitis acute; thyroiditis. Complaint: Six days ago acute sore throat, which was followed in two days by painful swollen fingers and wrists and later all joints of extremities involved except hips and shoulders. Much sweating, headache and nervousness. Anorexia and constipation. Fever for six days. Similar attack six years ago. Denies venereal disease. Examination: well-nourished and developed. Face flushed. Skin sweating and hypersensitive. Tongue tremulous and coated, grayish-white. Teeth, sound. Tonsils large, red and infected. Thyroid, palpably enlarged and tender. Heart and lungs normal. Polyarthritides acute of all joints of extremities excepting shoulders and hips. Temperature 100 to 102.4 F. Pulse 100 to 120. Urine, 1,028, acid, trace of albumin and a few hyaline casts. Blood: Reds 5,020,000, whites 17,800, hemoglobin 70 per cent. Blood-pressure 110 systolic. May 12, 7 a. m., given glucose, 50 gm. In three hours voided in urine glucose, 1.34 gm. Treatment: sodium salicylate and bicarbonate, each 1.3 gm. every two to four hours; oil of wintergreen and compresses of cotton applied to joints. May 28, discharged recovered. Tonsillectomy advised.

A review of the foreign literature of the last seven years shows the recognition of enlargement of the thyroid gland in acute articular rheumatism as a frequent occurrence. Vincent⁶ was apparently the first to note the fact. During 1906 and 1907 he made several reports to the Société médicale des hopitaux de Paris. Nov. 21, 1907, he reported that of 186 patients suffering from acute articular rheumatism he observed swelling and tenderness of the thyroid gland in 86 patients. In another communication he states that thyroiditis occurred in 66 to 68 per cent. of his patients who suffered with acute articular rheumatism. Eleven patients with acute rheumatism presented thyroid enlargement with tenderness, with acute symptoms of intoxication; tremor of fingers, tachycardia, extra cardiac murmurs and throbbing of vessels, profuse sweats, etc. Vincent observed a subsidence of the thyroid swelling, tenderness and overfunction coincidently with convalescent stage of the rheumatism. Vincent apparently interprets the thyroid enlargement and overfunction to a reciprocal reaction of the body in defence of the rheumatic infection. He observes that in obstinate acute rheumatism with complications the thyroid may be only moderately enlarged and may quickly subside. He believes this explains the value of iodids in obstinate cases. He also thinks that the

salicylates are of value in reducing this type of thyroiditis. He reports the continuation of the thyroid enlargement with all the phenomena of exophthalmic goiter in several patients and in a few patients with rheumatic thyroiditis subsequent atrophy of the gland with the development of scleroderma and other symptoms of hypothyroidism. Sougues⁷, Albertin⁸ and Weintraud⁹ report similar observations of thyroid enlargement, tenderness and symptoms of hyperthyroidism in acute rheumatic fever.

None of these reporters mentions the probability of the thyroid enlargement and tenderness being due to the same rheumatic infectious agent of focal origin.

These reports and the meager personal experience noted in the cases cited aroused the interest of the clinic as to the possibility of focal infection as a cause of goiter. The following case-reports are interesting and seem to show that there is an infectious type of goiter with and without symptoms of exophthalmic goiter, which seems to be of focal origin. The rapid subsidence of the goiter and the symptoms after removal of the foci of infection in the jaws and tonsils was a surprise. Bacteriologic examination of the tissues and alveolar pus revealed mainly streptococci. Autogenous vaccines were used with one exception in all the patients. No drug treatment with the exception of iron, for one, was used.

CASE 4.—Mrs. C. F., married, aged 49, U. S., admitted April 30, 1914. Diagnosis: Exophthalmic goiter; tonsillitis chronica; abscesses alveolaris. Complaint: Frequent sore throat; goiter for two years; muscular tremor for one year, much worse recently; tachycardia for more than a year; dyspnea of exertion; nervous and emotional; gradual loss of weight; lessened strength and endurance. Menopause at 47. Examination: Skin pale, pseudoscleroderma of hands, forearms and forehead; eyes normal; no lymphadenopathy; large goiter, partially cystic; heart, left border dullness 11 cm., tones pure, rate 96 to 100; muscular tremor, fingers; many carious teeth with alveolar infection (roentgenograms); tonsils enlarged, fissured and infected; blood: reds 4,700,000, whites 7,800, hemoglobin 65 per cent.; urine, normal; blood-pressure, 130, systolic. Treatment: Tonsillectomy; extraction of all teeth; rest and plentiful food. Result: May 12, 1914, discharged much improved. Goiter diminished more than half; symptoms of hyperthyroidism practically nil.

CASE 5.—Miss J. L., aged 18, telephone operator, U. S., admitted May 2, 1914. Diagnosis: Exophthalmic goiter; tonsillitis chronica; abscesses alveolaris. Complaint: Goiter, nervousness and emotion; muscular tremor; tachycardia; dyspnea of exertion; loss of weight and strength; headache; hot flashes and profuse perspiration; tonsillitis and confinement to house for a week every winter. Duration of symptoms six years. Examination: Well-nourished and good color. No exophthalmos; tonsils large and infected; six molar teeth show alveolar infection (roentgenograms); a moderate symmetrical, firm goiter; heart normal, pulse 80 to 110; temperature subfebrile; tremor of fingers; blood, normal; urine, normal; blood-pressure 100 systolic. Treatment: tonsillectomy, extraction of teeth with infected roots, autogenous vaccination with strains of streptococci obtained from tonsils and dental canals. May 18, 1914, discharged to family physician. Goiter has disappeared. Symptoms of hyperthyroidism much improved. June 18, 1914, the family physician reports the patient in good condition of health.

CASE 6.—Miss M. W., aged 20, telephone operator, U. S., admitted May 12, 1914. Diagnosis: Exophthalmic goiter; tonsillitis chronica. Complaint: Goiter for unknown period;

6. Vincent, H.: Sur la réaction thyroïdienne dans la rhumatisme aigu, et sur l'origine rhumatismale de certain cas du goitre exophthalmique, *Compt. rend. Soc. de biol.*, 1907, *lxiii*, 389; *Rapports de la maladie Basedow avec le rhumatisme aigu*, *Bull. de la Soc. méd. de Paris*, 1907, *xxiv*, 1286; *Semaine méd.*, March 20, 1907, p. 143; *ibid.*, Nov. 21, 1907, p. 575; *ibid.*, Jan. 1, 1908, p. 47; *ibid.*, Oct. 28, 1908, p. 527.

7. Sougues, A.: Goitre exophthalmique et rhumatisme articulaire aigu, *Semaine méd.*, Jan. 26, 1910, p. 47.

8. Albertin, André: Le corps thyroïde et le rhumatisme articulaire aigu, *Thèse de Paris*, 1911; *Arch. de méd.*, 1911, *iv*, 260.

9. Weintraud, W.: Der akute Gelenk-rheumatismus, *Spezielle Path. u. Ther. inner. Krankheiten*, Berlin, Kraus und Brugsch, 1913-1914, *ii*, Part 2, pp. 128 and 148.

rapid increase in size recently; tachycardia for year or longer; dyspnea of exertion; nervous and emotional; frequent subjective flashes of heat; prominence of eyeballs for a few weeks; loss of 15 pounds in weight in last few months; frequent sore throat; tonsillotomy three years ago. Examination: General pallor; moderate exophthalmos and lagophthalmus; tonsil stumps large and infected; teeth good, some dentistry; thyroid enlarged, symmetrical and firm; heart normal size, rapid, 100 to 120, somewhat irregular, tones pure, but snappy; tremor of extended fingers; reds, 3,300,000, whites 8,300, hemoglobin 60 per cent.; blood-pressure 125 systolic; urine, normal. Treatment: Tonsillectomy; rest; hematinics and plentiful food. May 20, 1914, discharged to family physician, much improved. June 18, 1914, family physician reports the patient much improved. Goiter much diminished in size. General condition excellent.

CASE 7.—Miss M. K., aged 24, telephone operator, U. S., admitted April 18, 1914. Complaint: Chronic arthritis of joints of fingers; frequent tonsillitis; goiter; occipitofrontal headache, fainting attacks and nervousness. Examination: Well-nourished; good color; tonsils large, fissured and infected; four lower teeth show alveolar infection (roentgenograms); swelling, soreness and stiffness of many joints of fingers; heart, lungs, urine and blood normal. No symptoms of hyperthyroidism. Treatment: Tonsillectomy, extraction of teeth with infected roots, autogenous vaccination with streptococci (*S. viridans* and *S. hemolyticus*) obtained from tonsils and dental canals. May 10, 1914, discharged much improved. June 6, 1914, returned and reported ability to return to work. Goiter practically disappeared. June 18, 1914, patient at work. Goiter about one half original size. General condition good. Arthritis of fingers much improved.

CASE 8.—Miss M. M., aged 21, telephone operator, U. S., admitted May 18, 1914. Diagnosis: Goiter; tonsillitis chronica. Complaint: Frequent sore throat, hoarseness; goiter of unknown duration, intermittent enlargement of lymph-nodes of anterior triangles of neck; nervous and emotional; lessened strength and endurance. Examination: Moderate exophthalmos and lagophthalmus; tonsils enlarged, fissured and infected; teeth, no visible infection, much dentistry; thyroid enlarged, chiefly the isthmus and right lobe; a few palpable submaxillary lymph-nodes; heart normal, 68 to 80; slight tremor of extended fingers; reds, 4,800,000, whites 10,300, hemoglobin 75 per cent.; blood-pressure 120 systolic; urine normal. Treatment: Tonsillectomy and rest. May 25, 1914, discharged to family physician much improved. June 18, 1914, family physician reports condition improved with the thyroid almost normal size.

CASE 9.—Miss E. S., aged 23, U. S., admitted May 19, 1914. Diagnosis: Exophthalmic goiter; tonsillitis chronica; impacted molar teeth. Complaint: At 17 became nervous and emotional, had tachycardia, loss of weight and strength, muscular tremor, moderate goiter, sweating, diarrhea, etc. Diagnosis of exophthalmic goiter and operation advised by home physician. Instead took rest cure. Improvement. Since then invalid with periods of improvement alternating with relapses. Now has tachycardia with irregular beating; nervousness, with hot flashes, insomnia and varying emotions; muscular tremor, generalized; profuse perspiration; diarrhea; occasional nausea and vomiting; weakness; loss of weight; exophthalmos and goiter. Had acute rheumatism at 12; sore throat on rare occasions. Menses irregular. Examination: Fairly nourished. Moderate exophthalmos; teeth, no caries, impacted molars (roentgenogram); tonsils large, buried, smooth exposed surfaces; thyroid visibly and palpably enlarged; heart, left border dulness 11 cm., rate 100 to 120, rhythm, somewhat irregular, tones pure; tremor marked; temperature range 98.6 F.; carbohydrate tolerance to glucose gm. 50.0 normal; urine normal; blood-pressure 140 systolic; reds 4,500,000, whites 9,000, hemoglobin 80 per cent. Treatment: Tonsillectomy. Removal of impacted teeth. Rest. June 3, 1914, discharged to family physician. Goiter and symptoms of hyperthyroidism practically disappeared. June 16, 1914, a letter from the patient's sister states marked condition of general improvement. She says patient expresses surprise at the disappearance of uncomfort-

able sensations which had existed so long that she had thought them natural phenomena.

CASE 10.—Miss G. O'B., aged 23, telephone operator, U. S., admitted May 20, 1914. Diagnosis: Exophthalmic goiter; tonsillitis chronica; abscess alveolaris; anemia secondary. Illness began one year ago with severe tonsillitis. Soon noticed goiter with extreme nervousness, muscular tremor, tachycardia and a complete nervous collapse in March, 1914. Examination: Well-nourished; pale; nervous; marked muscular tremor; no exophthalmos; symmetrically enlarged thyroid gland; three carious teeth with alveolar infection (roentgenogram); infected faucial tonsils; subfebrile temperature; pulse 96 to 130, heart-tones normal; blood: reds 2,580,000, whites 13,600, hemoglobin 40 per cent.; blood-pressure 125 systolic; urine normal. Treatment: Tonsillectomy; extraction of teeth with alveolar infection; hematinics; rest and good food. Result: Rapid improvement in goiter and symptoms of hyperthyroidism. June 18, 1914, patient continues to improve in a general way. Anemia less. Goiter still palpable, but symptoms of overaction of thyroid practically gone. This patient is the only one of the series of women who has not received vaccines.

No thyroid gland tissue was examined. Dr. E. C. Rosenow has recently made cultures from the deep tissues of many goiters, removed surgically in the treatment of exophthalmic goiter. Without exception he has been able to isolate and grow a streptobacillus of characteristic qualities. He is making experiments with the organism by animal inoculation and will make a report soon.

Farrant¹⁰ has investigated the pathologic changes of the thyroid in disease. He finds that certain microorganisms and certain toxemias may cause either a chronic hyperplasia with colloid or a complete acute hyperplasia. In the acute type the *B. aerogenes capsulatus*, *B. diphtheriae*, *B. dysenteriae* (Asylum, Shiga and Flexner types), *B. anthracis*, *B. tuberculosis*, *B. mallei*, bacillus of tetanus, *Micrococcus catarrhalis*, *Spirochaeta pallida*, *Plasmodium malariae*, chronic nephritis, cirrhosis of liver and toxemias due to abrin, ricin and diphtheria toxin produced rapid hyperplasia. Animal inoculation and examination of animal and human thyroids were the basis of the report.

In the chronic type, the coliform bacillus (chr.) tuberculosis, chronic, Malta fever, syphilis, actinomycosis, acute poliomyelitis, rheumatic fever, scarlatina and pernicious anemia were associated with thyroid enlargement. Involution of the thyroid followed the subsidence of the systemic disease.

That Farrant should not find acute hyperplasia in rheumatic fever is probably due to the absence of clinical observation.

THE WIDER APPLICATION OF THE ETIOLOGIC IMPORTANCE OF FOCAL INFECTION

To the now well-known relation of focal infection as a chief factor in the etiology of acute rheumatism, chronic deforming arthritis, gonorrheal arthritis, malignant endocarditis, myositis, myocarditis, septicemia of various bacterial types, tuberculosis, nephritis and visceral degeneration, we may add certain infectious types of thyroiditis, with or without hyperthyroidism, pancreatitis acute and chronic, with or without resulting glycosuria, peptic gastric and duodenal ulcer and cholecystitis.

With the defenses of the body diminished by overwork, exposure to cold, dissipation, insufficient or improper food, unhygienic surroundings, injuries from

10. Farrant, Rupert: The Pathological Changes of the Thyroid in Disease, Brit. Med. Jour., Feb. 28, 1914, p. 470.

former disease, (valvular scar) or trauma, the individual may suffer from acute rheumatic fever, chronic arthritis, myositis, chronic infectious endocarditis, pneumonia, ulcer of stomach, cholecystitis or pancreatitis, respectively dependent on the phase of mutation in pathogenicity, and affinity of the strain of the streptococcus-pneumococcus group in the focus of infection. These principles are important because proper management may (a) prevent the systemic disease and (b) guide one in the proper treatment of the systemic disease. The recognition and removal of chronic foci anywhere in the body is imperative as a prevention of progressive ill health. Emphasis should be made of chronic alveolar abscess, often unrecognized by the patient. Film roentgenograms of the jaws is often the only means of recognition. A pathologic tonsil is a menace and should be wholly removed. Chronic cholecystitis and chronic appendicitis should be promptly treated surgically. Chronic sinusitis may exist for years and finally be an important factor in the development of systemic disease. Following the removal of the focal infection, adequate individual and general hygiene will improve the body defenses and health will be maintained.

The removal of the focus of infection is demanded as a fundamental principle, in the treatment of the systemic diseases especially of the chronic type. Thereafter the management must be individual, based on the character and location of the infection. The attempt to immunize the patient against the infection must be attempted by restorative measures—food, pure air, passive and active graduated exercise, hematinic and other tonics, optimistic surroundings, etc. Autogenous vaccines may be used with rational reservation.

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THE NEWER BACTERIOLOGY OF VARIOUS INFECTIONS AS DETERMINED BY SPECIAL METHODS *

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The bacteriology of most infections as worked out heretofore is largely the bacteriology of the fluids of the body and semifluid exudates. In acute infections a bacteriologic study of the fluids commonly yields trustworthy results, but in many chronic conditions the cultures are usually sterile and demonstration of bacteria in the tissues usually fails.

In this short paper I wish to describe methods for making cultures particularly from excised tissues and from the blood and other fluids in which due regard is paid to the question of oxygen pressure, particularly in the primary culture, and to detail very briefly the results obtained by their use in various infections.

PREPARATION OF THE EMULSION FROM THE TISSUES

The tissues are excised with strict aseptic precautions usually under local anesthesia and cultures made at once, a portion being reserved for microscopic study. In addition to the great care used to avoid contamination from skin or air the surface of the part used for cultures is sterilized by dipping it into boiling water, or even better, into a vigorous Bunsen flame,

or seared with a hot blade, then rapidly cooled in sterile salt solution and emulsified in the specially devised sterile air-chamber or "tissue-crusher" shown in the accompanying illustrations. The amount of heat used is determined by the size of the tissue at hand. Whenever possible, pieces of tissue at least 2 to 3 cm. in diameter are used for cultures.

The chamber (Fig. 1) is somewhat similar to the one already described¹ except that it contains a larger mortar and a small-sized meat-chopper.² It consists of an air-tight tin can (19 by 23 cm.) containing a large (10 cm.) hole on one end with a flanged rim to which is tied a long-sleeved, heavy, fleece-lined canvas glove; there is a smaller side opening (3 cm.) which is plugged with cotton and a large opening (8 by 12 cm.) at the top which is covered with mica and held in place by circular wires and surgeons' adhesive plaster. The meat-chopper is held in place through a hole at the farther end through which the shaft extends and a hole at the bottom through which a thumb-screw fits whereby it is clamped to a wood extension, fastened to a semicircular wood board nailed to the end. On the inside is fastened a suitable-sized tin can which serves as the mortar holder. The container without the meat-chopper answers very

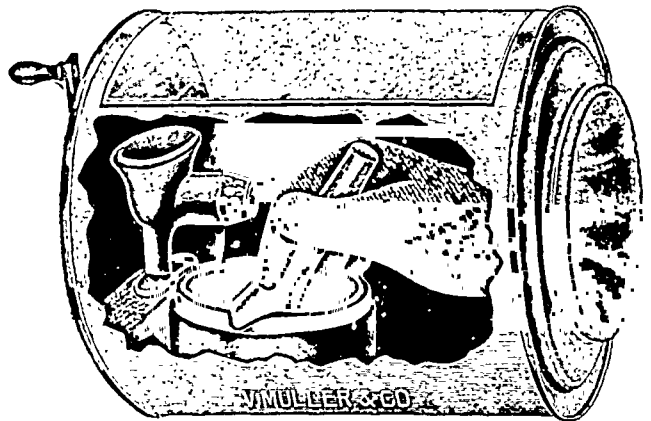


Fig. 1.—Sterile air chamber. The right hand is used inside the apparatus.

well for small or relatively soft tissues, such as the lymph-glands in arthritis, while the one containing the meat-chopper is preferable for emulsifying larger and firmer tissues such as the thyroid gland, cystic ovaries and the glands in Hodgkin's disease. Sterilization is done in dry heat at 160 C. (320 F.) for one hour. For actual use the right hand and forearm are thoroughly scrubbed with soap and water and soaked in 1:1,000 mercuric chlorid and then introduced into the container and glove. Alcohol should not be used in sterilizing the hand because the vapors are apt to ignite with explosive violence when the side opening is flamed after removing the cotton plug; the mouth of the tube or bottle containing the tissue is flamed and held near the small opening in the side and the tissue grasped with long sterile forceps, and with the least possible exposure to the room air, inserted into the container and either cut into small pieces with the scissors or passed through the meat-chopper. Great care is exercised at all times not to move the gloved hand in or out of the container while the cotton plug is removed.

* Read before the Section on Practice of Medicine at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

¹ From the Memorial Institute for Infectious Diseases.

1. Rosenow: *Centralbl. f. Bakteriol., Orig.*, 1914, lxxiv, 366.

2. The meat-chopper is an inexpensive commercial article designated the "Baby Masticator" and manufactured by the Enterprise Manufacturing Company, 176 North Dearborn Street, Chicago.

After grinding the tissue in the mortar for a time, sterile quartz-sand and the emulsifying fluid, usually dextrose broth, are poured into the mortar through the side opening from thoroughly flamed test-tubes. The cotton plug is reinserted and the emulsifying process is continued. The emulsion when completed is poured into a thoroughly flamed test-tube or graduate of suitable size, inserted through the side opening.

In attempting to simplify as much as possible the emulsification of tissues and to check up the results obtained with the sterile air-chamber, the "tissue-crusher" (Fig. 2), a modification of the method used by Hirschfelder to obtain tissue juice, was devised. It consists of two close-fitting threaded metal tubes; the outer tube is fitted with an air-tight removable bottom, the inner surface being made rough, and a four-sided rim, while the inner tube is fitted with a removable disk containing numerous very small drilled holes and a handle which serves as a wrench. The inner tube is plugged with cotton and placed inside

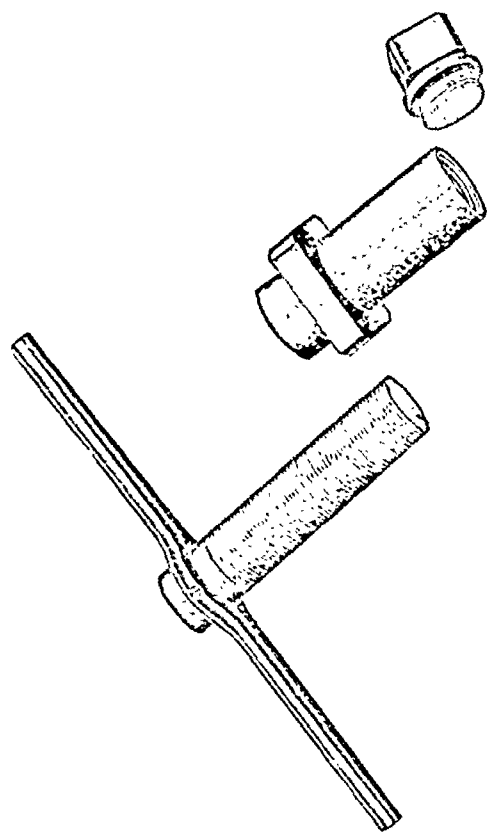


Fig. 2.—Tissue crusher.

the other and the instrument sterilized in hot air. In order to prevent leakage the thread of the inner tube should be covered with hot sterile paraffin or petroleum oil just before using. The tissue is placed in the outer tube and the inner tube turned in the outer, using the necessary force until the tissue is crushed and expressed into the inner tube. The instrument is now held slantwise, the cotton plug flamed and removed, the emulsifying fluid added and the emulsion transferred to a sterile test-tube with a sterile pipet.³

METHOD OF PREPARING THE BLOOD-CULTURES

In order to furnish bacteria from the blood and other sources a gradient of oxygen pressure, the following method for making blood-cultures has been used with good results: From 15 to 30 c.c. of blood are

withdrawn from the vein at the bend of the elbow in the usual way and decalcified, by adding it to a solution of 2 per cent. sodium citrate in sodium chlorid solution in the proportion of 5 c.c. of blood per 1 c.c. of solution. Control tests have shown that the bacteria contained in the blood from a wide range of conditions live in this solution for at least seventy-two hours. The citrate solution is kept in a tube of suitable size closed by an aluminum screw-top containing a rubber disk and sealed with paraffin. This may be used at the bedside and then sent to the laboratory for cultures in case, for some reason, it is not convenient to make the complete culture at the bedside. In my work a portion of the citrated blood has been at once planted and the remainder added by means of a sterile pipet to sterile distilled water contained in bottles which serve as centrifuge tubes, there being at least 10 parts of water to 1 part of citrated blood. This is centrifuged at once and the supernatant hemoglobin containing water is poured off or the sediment removed with a sterile pipet, and planted. The sterile water serves as a means of getting rid of the hemoglobin and the serum. Control tests with the serum after the corpuscles have separated by gravity show that in the aerobic cultures the inhibiting action of the hemoglobin is more marked than that of the serum; in fact, the serum is a desirable constituent in streptococcal cultures. Hence in suspected streptococcal infections the serum and the sediment of the dissolved corpuscles may be planted separately. In some instances the hemoglobin has been converted into methemoglobin by passing carbon monoxid (illuminating gas) through the decalcified blood by means of a sterile pipet containing a long sterile cotton plug.

THE PREPARATION OF THE CULTURES

The emulsion of the tissues or the sediment of the dehemoglobinated blood is inoculated in the way best suited for the particular case at hand. Shake-cultures in tall columns (10 to 20 cm.) of ascites dextrose (1 per cent.) agar and plain agar (0.5 to 0.8 per cent. acid to phenolphthalein) with or without serum have yielded the best results. The ascites fluid is collected in a sterile manner and heated on successive days to 60 C. (140 F.) for one hour or for twenty-four hours and used only after the sterility has been determined. To 9 parts of 0.5 per cent. agar, prepared from Liebig's extract of beef and Witte peptone, 1 part of ascites fluid is added with a sterile pipet after the agar is either thoroughly boiled in a bath or steamed in an Arnold sterilizer for at least fifteen minutes to drive off molecular oxygen, and cooled to 60 C. The emulsion or other material is added to the agar when cooled to 39 C. (102.2 F.) by inserting the mouth of the pipet to the bottom and forcing out its contents while the pipet is withdrawn. After the cotton plug is flamed and replaced in the test-tube the further mixing is accompanied by partially inverting the tube once or twice. Care is exercised not to blow bubbles of air through the agar.

Owing to the oxygen-consuming power of living cells the bottom of the tubes is rendered anaerobic while the top necessarily remains aerobic, and the space between represents a gradient of oxygen pressure between the two extremes. In order to bring about a still greater range of conditions in view of the consideration that the emulsion or tissue juice may be bactericidal or may favor the growth of the bacteria,

3. The sterile air-chamber may be made in the laboratory, while the tissue-crusher requires a well-equipped machine-shop for its construction. Both may be purchased from V. Mueller & Co., 1779 Ogden Avenue, Chicago.

only a small amount of emulsion is added to some tubes and a large amount to others. In the case of the blood-sediment or joint fluid when only a small amount is at hand, pieces of sterile rabbit or guinea-pig tissue are added to the bottom of the tube if strict anaerobic conditions are desired. A gradient of H and OH ions in the mediums, obtained by superimposing a plus 1 agar or a minus 1 agar and vice versa has also been found useful in some conditions.

Plain serum or ascites, agar and broth, ascites-dextrose-broth in tall tubes, enriched ascites fluid, with or without sterile tissue the surface of Loeffler's serum, plain and dextrose blood-agar slants and plates, kept under aerobic and anaerobic conditions, and at times litmus-milk and ox-bile, and in Hodgkin's disease Dorset's egg mediums are also inoculated. These, while not as favorable culture mediums, have yielded positive results in isolated instances when the shake-cultures in agar were negative. The cultures are incubated at 37 C. for ten to fourteen days before they are discarded. The tubes of dextrose-agar are carefully examined for colonies in a strong light. Smears are made from the water of condensation of the Loeffler's serum and blood-agar slants, of the liquid cultures if turbid and of the sediment always, and from the bottom of the tube of agar even though no colonies are found. Colonies in the depths of the dextrose-agar are examined by breaking the tube cross-wise by means of a glass cutter and a red-hot bead at the end of a glass pipet, the surface of the tube being sterilized in the flame just before breaking it. If a positive result is obtained, at least one of the subcultures is made in such a way as to reproduce as nearly as possible the conditions under which the original growth was obtained. This point is particularly important with those strains which show a preference for anaerobic conditions. Search for unknown bacteria was made in smears stained in various ways from the cut surface of the glands and various emulsions and from the depths of the cultures both by staining and with the aid of dark-field illumination.

RESULTS

By this method, which is similar to those employed by Theobald Smith and Noguchi but in which there is afforded not only aerobic and anaerobic conditions but a gradation of oxygen pressure between these two points, a gradation of H and OH ions, and a wide range of nutrition, positive cultures have been obtained frequently while cultures made in the usual way remained sterile.

Thus certain non-hemolyzing streptococci have been isolated from the blood repeatedly when the usual method failed or showed much fewer colonies; in leukemia this has happened as long as four months before death; in rheumatic fever during the height of the disease in 5 of 9 attempts; in peliosis rheumatica in 2 cases, and occasionally from arthritis deformans. Hemolytic streptococci were obtained from three cases of puerperal sepsis; the *Streptococcus viridans* in two cases of chronic infectious endocarditis, while the results of the usual cultures suggested the "bacteria-free stage" (Libman) of the disease. Diphtheroid-like organisms have been isolated from the blood during the febrile period in four cases of Hodgkin's disease, and the same organism from the blood as from the nodes in two of three cases of erythema nodosum in which blood-cultures were made. Diphtheroid bacilli

have been isolated from the blood in four cases of severe infections resembling rheumatism; the *Bacillus aerogenes capsulatus* (*B. welchii*) from the blood in one case of bronchopneumonia, one case of acute rheumatism, and in leukemia.

Streptococci corresponding to those which I have isolated previously from the joints have been isolated from glands draining the involved joints in twelve cases and *B. welchii* alone or in conjunction with streptococci in four of twelve cases of acute articular rheumatism.

In 54 cases of arthritis deformans one or more glands draining the joints have been examined in each case. Non-hemolyzing streptococci producing usually no distinct green on blood-agar plates and often showing a marked preference for anaerobic conditions in the primary culture but otherwise resembling *Streptococcus viridans* have been isolated 32 times; staphylococcus 5 times; an organism resembling *B. mucosus* 3 times, *Micrococcus catarrhalis* and the gonococcus once each, *B. welchii* in 14 cases, and diphtheroid bacilli in 5 cases. In 7 cases the cultures remained sterile. In both rheumatic and deforming arthritis the same organisms have been isolated simultaneously from the fluid or capsule of the joints and the excised gland.

A diphtheroid bacillus showing a wide range of preference for oxygen in the different cases has been cultivated in all of some 40-odd cases of Hodgkin's disease; a staphylococcus in 17; *Streptococcus viridans* in 7; *B. welchii* in 14, and an unidentified Gram-negative motile bacillus in 6 cases.

A non-hemolyzing, sometimes green-producing (blood-agar) streptococcus has been obtained from the depth of the tissue in 16 of 21 chronic indurated duodenal and gastric ulcers, and from the small glands adjacent to the ulcer in 4 of 5 cases. A staphylococcus-like organism was present usually in smaller numbers in 16; *Staphylococcus aureus* only once. The base of the ulcers was either entirely sterile or contained only a small number of bacteria and yeast-cells. The number of colonies of streptococci was roughly proportionate to the gross or microscopic evidence of inflammation. Only one perforating ulcer was examined and this showed the largest number of colonies of streptococci. The negative results obtained were in ulcers which seemed to be practically healed. *B. welchii* was isolated from the ulcers in 6 cases and from the adjacent glands in 3. Three ulcers showed diphtheroid bacilli, 4 yeast-cells, and in a number there were found a few colonies of a large Gram-positive aerobic bacillus, probably belonging to the *subtilis* group. The colon bacillus was found only once in the simple ulcers excised at operation, but was present in large numbers in one examined shortly after death and in small numbers in two out of three ulcers the seat of carcinoma.

Streptococci quite similar to those from the ulcers have been isolated in pure culture from the excised tissue of the gall-bladder in cholecystitis in one case and from the center of gall-stones in 4 of 7 cases. *B. welchii* and *B. coli* were found together with the streptococcus in the gall-stones in one case and a bacillus resembling closely the typhoid bacillus in another.

A polymorphous, sometimes clubbed, diplobacillus was obtained in pure culture from excised nodes in each of 7 cases of erythema nodosum; from a cervical lymph-gland draining an infected tonsil in one case

and in mixture from the focus of infection (tonsil and superficial ulcer on anterior pillar) in 2 cases of erythema nodosum.

An anaerobic Gram-positive diplobacillus-like organism has been isolated from the thyroid gland removed at operation in 25 out of 32 cases of goiter (mostly exophthalmic goiter) in man, from the blood on two occasions in a severe case of exophthalmic goiter, and in conjunction with Dr. Moon, in 8 of 12 dogs having goiter. We failed to obtain the organism from the gland in six of seven dogs showing apparently normal-sized thyroid glands, while one showed a few colonies. *B. welchii* was found in all but 6 of the thyroid glands examined. Three of these were normal glands in dogs. A staphylococcus which usually produces hemolysis on blood-agar and grows unusually well anaerobically was found in most of the goiters in those from both man and dog. It is as yet impossible to state whether or not this coccus comes from the skin, although it perhaps does not. Non-hemolyzing streptococci have been isolated in 3 goiters from man and in 2 goiters from dogs.

Cystic ovaries from 25 patients have been examined by this method. Streptococci, often good green-producing, have been found in pure culture in 14, in some instances, both from the cyst fluid and the emulsified tissues; but the cyst content is usually sterile. A partially anaerobic diplobacillus resembling quite closely the organism from the thyroid gland has been found in 4; staphylococci in small numbers in 3; *B. welchii* in all but 5 cases.

SIGNIFICANCE OF THE FINDINGS

The common localization and lesions produced on intravenous injection of streptococci soon after isolation from acute rheumatism, from arthritis deformans, from ulcer of the stomach and from the tissue of the gall-bladder in cholecystitis and the center of gall-stones, together with other facts, suggests strongly that they are not secondary invaders but the important etiologic factor in each of these conditions because the strains from rheumatism commonly produce arthritis, endocarditis, myocarditis and pericarditis; the strains from arthritis deformans, arthritis and myositis but rarely endocarditis or pericarditis; the strains from the depths of ulcers of the stomach often show a striking affinity for the mucous membrane of the stomach and duodenum (dogs and rabbits); while those from the gall-bladder and the center of gall-stones commonly produce cholecystitis. The bacillus isolated from erythema nodosum when injected as isolated showed a marked affinity for the subcutaneous tissue in dogs, rabbits and guinea-pigs, producing localized hemorrhages followed by infiltration resembling the nodes seen in man, the lesions often being symmetrically placed usually near a relatively large blood-vessel. On artificial cultivation and on animal passage the strains lost this peculiar property. In both instances the organism tended to become a streptococcus and on passage it acquired an affinity for the joints, fascia, muscles and endocardium. This fact would seem to afford an explanation of the common occurrence of arthritis and sometimes endocarditis in erythema nodosum and allied conditions.

The almost constant presence of diphtheroid organisms in the glands and their demonstration in the blood in Hodgkin's disease in conjunction with the results of experiments on monkeys by Bunting and Yates and

by Negri and Mieremet, and the good results obtained in some cases by the use of autogenous vaccines suggest strongly that these organisms play at least a prominent rôle in this disease; but the fact that other organisms are commonly found also and that diphtheroid bacilli indistinguishable from some of the strains from Hodgkin's disease are found in many other conditions compels one to wait for more experimental evidence before concluding that these bacilli are the real cause of Hodgkin's disease.

The etiologic rôle of infection in goiter is becoming more apparent; enlargement of the thyroid gland has been noted in various infections, particularly in rheumatism; and the peculiar distribution of endemic goiter, and other clinical facts, suggest that the cause of simple and exophthalmic goiter may be due to an infection. The symptoms and the enlargement of the gland, however, have usually been considered toxic in nature and not due to localization of the bacteria in the gland. No one, as far as I can learn, has isolated an organism from the thyroid in a series of cases. The fact that the same organism has been isolated from goiters in both dogs and man, and in the latter apparently in proportion to the degree of symptoms and from the blood, the absence of this organism in normal thyroid glands in dogs, the fact that it lives longer in the thyroid gland than in the kidney and other tissues of dogs following intravenous injection, and that goiter has appeared in two dogs after intravenous injection of this organism, suggest that goiter may be due not only to toxins produced in other regions of the body but to an actual localization in the gland of bacteria. Studies of the chief organism found show that it is probably closely related to the streptococcus group and this may explain why thyroid enlargement is observed commonly in rheumatism and in cases having foci of infection in which the predominating flora is streptococcal.

The significance of the findings of the streptococcus in cystic ovaries is not yet clear. Further experiments on animals are necessary and the immunologic reactions in the various conditions, particularly in goiter and cystic ovaries, need to be worked out before definite conclusions can be drawn. It may be that the organisms isolated are merely secondary invaders. The rather frequent occurrence of diphtheroid-like organisms in the tissues and blood during life is, I believe, significant. They are probably not wholly secondary or harmless invaders.

Altogether the *B. welchii*, or an organism closely related, has been isolated from various tissues in man 103 times and from the blood or joint fluids six times. It has frequently been found in various tissues, such as the thyroid, muscle and kidney of dogs and occasionally in livers of rabbits and guinea-pigs. On account of this surprising finding and because the organism is an anaerobe and spore-bearing, every possible source, especially the serum and ascitic fluids, other than the tissue inoculated has been excluded by control-tests. The common presence of this organism in the tissues of man and the dog (carnivorous animals) and its absence in the rabbit and guinea-pig (herbivorous animals) is, I believe, of significance. It exists in the tissues probably chiefly in the spore form and the growth usually does not result except when the oxygen pressure has reached a certain grade. The fact that the strains grow readily at a certain grade of oxygen pressure without production of gas and that

they produce the characteristic growth with gas formation only under strict anaerobic conditions suggest that under special circumstances (a lowered oxygen pressure, increased virulence or growth in symbiosis with other bacteria perhaps) *B. welchii* may not be an entirely harmless invader.

Finally, whatever the ultimate significance of these findings may prove to be, the common isolation of bacteria from tissues which have been considered sterile is of definite importance, lends support to the contentions of Adami and others that certain ill-understood conditions are due to a low-grade infection and not merely intoxication and calls for an extensive study of the whole question by this or similar methods.

I wish to express my very great appreciation to the numerous physicians, particularly Dr. Billings, who have supplied me with material. The more complete reports are to appear in the *Journal of Infectious Diseases*.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. BILLINGS AND ROSENOW

DR. WILLIAM S. THAYER, Baltimore: There has been no one circumstance in the last fifteen years that has so changed the aspect of the practice of medicine as the recognition of the influence of local foci of infection on the production and course of a variety of general processes of previously uncertain etiology. In the discussion on cardiac disease, Dr. Cabot, in his classification, referred to the "rheumatic" cases, stating that although the term was rough and general, it yet covered those infections which are commonly associated with arthritis as well as cardiac disease. It is well to emphasize this association. When one meets to-day a mitral stenosis or insufficiency he proceeds in a very different way from that in which he did twenty years ago. One's first thought now should be to search for a focus of chronic infection by the removal of which the probability of progression of the malady may be greatly reduced. The proportion of cases of valvular disease of uncertain origin that show old chronic affections of sinuses, of teeth, especially of the tonsils, is very large. I would emphasize also that in tonsillar operations it is most important that the operation be complete. In a very large number of patients who come to me with the statement that their tonsils have been removed, it is easy to demonstrate that most of the lower pole of the tonsil is still present, the crypts often sealed by cicatricial tissue and more dangerous perhaps than before operation. Even in the hands of men whose technic is very good it is not uncommon to see in young people a hyperplasia of small islands of lymphoid tissue which remained after operation. These little islands may later be infected and give rise to all the symptoms formerly experienced.

DR. A. C. GRIFFITH, Kansas City, Mo.: It has been my good fortune since the discovery of the diphtheroid bacilli to see a few cases of Hodgkin's disease. One case in particular occurred in an elderly lady who had been suffering for six or seven years with glandular enlargement. We removed one of these glands and developed the diphtheroid bacillus; also a coccus. Dr. Rosenow has described their clinical characteristics. These organisms are mostly of the aerobic type. The patient was put on autogenous vaccines made from the growth of the organism. The treatment was given in gradually increasing doses until the swelling of the glands began to disappear and the patient was doing nicely. She, however, was persuaded to take up Christian Science. Two weeks later I was called in when she was dying from overinfection or intoxication as a result of the activity of the glands. Necropsy showed that the changes in the glands were those characteristic of Hodgkin's disease; there was the degeneration and softening in the center and the outer harder portion. We used the vaccines three hundred millions to the cubic centimeter. I started in with 0.5 c.c. and

increased the dose to 2 c.c. I gave first a dose every three or four days and toward the last 2 c.c. every other day, and the glands were disappearing when the patient left me to follow one of the cults.

DR. FRANK SMITHIES, Chicago: In the study of the histories of nearly ten thousand cases of gastro-intestinal trouble I have been struck by the fact that aggravations of the disturbances were quite common in the spring and the fall. It will be especially noted that this happens in the case of peptic ulcer. It will also be recalled that these seasons of the year include the periods during which epidemic infectious diseases are most prevalent. In view of Dr. Rosenow's investigations, infection of the gastric mucosa by micro-organisms might occur at these periods during the course of the disease. In the case of ulcers already existing, reinfection may occur and the process be lighted up. The acid reaction of the stomach is no criterion of its bacterial cleanliness. I have shown this by my study of the findings in more than 7,000 consecutive test-meals. In the majority of the gastric-ulcer cases, there is a possibility of finding foci of infection elsewhere. Studying 1,500 peptic ulcers, I find that in more than 60 per cent. coincident or earlier infection of the gall-bladder or appendix could be noted. In cases of cholecystitis, with or without stones, there was pancreatitis in 12.5 per cent., and in common-duct obstruction, pancreatitis was noted in more than 28 per cent. of instances. It should be emphasized that cleaning up a local focus, as in the mouth, does not guarantee that patients will recover from damage that has already been done in the extensive area of the gastro-intestinal tract.

DR. E. LIRMAN, New York: The occurrence of exacerbations in cases of duodenal ulcer following so-called colds has been particularly emphasized by Hershell of London. In trying to establish a diagnosis between duodenal ulcer and cases of functional disturbance a history of such occurrence is of value. I was interested in Dr. Rosenow's statement that he is not willing definitely to accept the organism described in connection with Hodgkin's disease as being the cause of the disease. Dr. Celler has made a study of a number of cases of various forms of diseases of lymph-nodes and has found the bacillus not only in cases of Hodgkin's disease, but also in other diseases of the lymph-nodes, and particularly in two cases of typical tuberculosis. Apart from that, the *Streptococcus viridans* has been found in lymph-nodes in cases of Hodgkin's disease as well as in other lymph-nodes. Complement-fixation tests made by Dr. Olitsky in cases of Hodgkin's disease have proved to be absolutely negative in all instances. These findings lead us to be careful before accepting the organism as being the etiologic factor in the disease and make us keep in mind the question of latent microbism. There is no doubt that Dr. Rosenow has produced definite mutations in the streptococcus-pneumococcus group. As regards Dr. Rosenow's statement that the organisms from a certain type of infection cause, at least for a time, the same lesions in animals as in man, some work done by Drs. Rothschild and Thalheimer indicate that exceptions occur. They succeeded in 50 per cent. of the inoculated animals, in producing arthritis with recently inoculated strains obtained from cases of subacute endocarditis in man. Pericarditis has been found in animals inoculated with the same organisms and this is a very unusual phenomenon in the disease from which the organisms are obtained.

DR. JAMES M. ANDERS, Philadelphia: These two papers rivet the attention of the profession especially on the head as the seat of infective foci. It has long been well understood that in the case of acute miliary tuberculosis invariably an old focus exists somewhere in the body, most frequently in the lungs, from which the tubercle bacilli come. These papers emphasize the importance of a careful inspection of the mouth and throat as a part of our routine examinations of patients. If foci of inflammation are found there, they should, of course, be energetically attacked without delay. It is important to recollect that if removal of such focal infections fail to bring about a cure of the condition from which the

patient may be suffering, it is not evidence to the contrary, but means, as pointed out by Dr. Billings, that hematogenous metastasis has already taken place. The American Medical Association has its Section on Stomatology, and it would be entirely proper, it seems to me, for the Section on Practice of Medicine to urge, through the House of Delegates the establishment of chairs of Stomatology in our medical colleges.

DR. DE LANCEY ROCHESTER, Buffalo, N. Y.: I wish to speak of focal infections especially of the teeth and tonsils. In three cases having teeth infections accompanied by endocarditis in which there were no manifest symptoms in the mouth, but in which the Roentgen ray showed an abscess at the roots of the teeth, when the abscess was removed the symptoms subsided and the patients improved clinically. The organism found was the ordinary streptococcus pyogenes. I have had four cases which have impressed on me the importance of having the tonsils completely removed in cases of infection. The danger of an incomplete operation is illustrated in one case in which the toxic process had gone too far before the trouble was recognized. The patient was a woman who gave a history of rheumatism, multiple arthritis and endocarditis which had been treated in the hospital for two weeks. She improved under the salicylates and got up. Later she had a recurrence, ushered in with a temperature of 104.5 F. and her pulse was uncountable. She gave a history of having had a tonsil operation ten years before. There was also a history of sore throat and an exudate over the tonsils. The condition of the patient was so serious that she could not be operated on. She died of severe systemic toxemia, in all probability due to infection from the tonsils.

DR. ALFRED STENGEL, Philadelphia: Dr. Rosenow's statement with regard to the cause or the part played by the organism in Hodgkin's disease was very conservative. He said that we are not sure of the relation of the diphtheroid organism to Hodgkin's disease, but it seems to me that we are sure that this organism is the specific organism of Hodgkin's disease. I have only four cases of such infection to report: one of endothelioma; chronic simple inflammation of the glands; one of lymphoid enlargement in a patient with rheumatoid arthritis, and lastly another rheumatoid case not easily classified.

DR. J. BIRNEY GUTHRIE, New Orleans: Has Dr. Rosenow applied his technic in finding the cause of the short fevers of obscure origin in children, which are accompanied by lymphatic enlargement—the so-called glandular fevers? These symptoms of unexplained fever and lymphatic enlargement are quite common in children and it would be interesting to have this method applied to their investigation.

DR. HARVEY D. WOOD, Fayetteville, Ark.: Owing to the rapid progress that has been made in our knowledge of the cause of inflammation and infection, I believe the time has come when the definition of the termination "itis" should be made to include infection as well as inflammation. Since listening to Dr. Billings' paper and the following discussion I have been more than ever fully impressed with the need of a more comprehensive definition of this termination. The phenomena of seasonal recurrences and exacerbations of ulcer, due to infection, have been so clearly set forth in this discussion that it gives us a better understanding of many pathologic processes. The infection that comes from the bite of the infected bedbug is now thought by some, who are doing special work on this line, to be the cause of pellagra. This disease has its period of exacerbation in the spring-time, when this pestiferous insect begins to get busy. Should this prediction prove to be the true source of the pathology of this disease, there are many persons whose minds will be relieved from the fear of having this malady.

DR. FRANK BILLINGS, Chicago: In our group of workers we know that Dr. Rosenow is dependable. He has an opportunity to study disease clinically. The diphtheroid bacillus has been successfully cultivated from the enlarged lymph nodes of about forty, and from the blood of five patients with Hodgkin's disease. These five had fever. The histology

of the glandular tissues varied from typical Hodgkin's to simple lymphocytomas, lymphosarcoma and tuberculosis. In one lymphosarcoma the organism could not be cultivated. Many of these patients have received the autogenous vaccine subcutaneously in the dosage of 10,000,000 to 1,500,000,000 usually repeated once a week. Two have received the vaccine in large doses intravenously. Used subcutaneously there is no recognizable general reaction. Intravenously, general reaction has been noted; fever, rapid pulse, general discomfort, headache, etc. Practically all patients have also been treated with efficient roentgenization. In the chronic non-febrile cases the vaccines and roentgenotherapy seem to produce better results than the Roentgen ray alone. We are now preparing a report on the series of patients. Dr. I. Hektoen will report the histopathology of the glands, Dr. Rosenow will give the bacteriology and I shall prepare the clinical data. We are now attempting to immunize a horse with mixed strains of the diphtheroid bacillus. If successful we shall add the serum to the treatment.

DR. E. C. ROSENOW, Chicago: One word as to the importance of foci of infection other than those of the mouth. I recently saw a patient in Dr. Billings' service who had rheumatic endocarditis, pericarditis, etc., which apparently was the result of an infected ingrowing toe-nail. The toe was operated on, the streptococcus isolated and the disease reproduced in dogs and rabbits. Another patient had severe rheumatism including pericarditis and endocarditis which began ten days after a crushing injury of the thumb. Again the disease was reproduced with the streptococcus isolated from the wound on the thumb. I am sorry that I am not prepared to say what the cultures of the glands show in the short fevers in children with glandular enlargement. I believe that the glands in these cases contain bacteria which are the cause of the disease. Streptococci were isolated from the glands in seven of the cases of Hodgkin's disease. It is quite well known that ulcers heal more quickly in the cardiac end of the stomach than in the pyloric end or duodenum. This is generally believed to be due to mechanical causes, but if streptococci play a rôle in the etiology of ulcer, as seems likely, why might not this be due in part to a greater bactericidal power of the mucous membrane of the former because acid-secreting, than that of the pylorus and duodenum in which no acid cells are present? The infectious nature of ulcer would best explain the seasonal exacerbations and the recurrences which come without known cause, the recurrences taking place when the immunity of the blood from a previous attack has disappeared. The most important factor in the management of ulcer of the stomach—the recognition and removal of various foci of infection—has been overlooked in the past. Proper regard of this point should reduce the incidence, percentage of recurrences and earlier healing of ulcer of the stomach and duodenum.

Good Roads Prevent Disease.—Few persons, on first thought, would see any possible connection between good roads and good health. Yet the State Board of Health of Kansas says that good roads can and will prevent disease. How? By the removal of weeds and trash. Weeds and trash prevent the prompt evaporation of moisture and promote retention of ground water. These make ideal breeding spots for mosquitoes, flies and other disease carriers. . . . Good roads also prevent disease by providing good drainage. Many farms have no means of drainage except by ditches along roadways. Open ditches, clear of brush and debris, with hardened surface and proper fall, afford these farms the opportunity of ridding themselves of many a stagnant pool. . . . Road-oiling in itself is destructive of insect larvae, especially mosquitoes—a well-known fact. Dry roads offer pedestrians and notably children who are compelled to walk to and from school, dry shoes and feet. . . . Good roads are active disease prevention agencies, aside from their financial and commercial value.—*Monthly Bull. Ohio State Board of Health.*

GASTRO-INTESTINAL STUDIES

II. THE FRACTIONAL STUDY OF GASTRIC DIGESTION
WITH A DESCRIPTION OF NORMAL AND
PATHOLOGIC CURVES*MARTIN E. REHFUSS, M.D., OLAF BERGEIM, Ph.D.
AND
P. B. HAWK, Ph.D.
PHILADELPHIA

For years the experiments of Pawlow¹ and his school seemed to be the last word in the study of digestion, and the results which they obtained on dogs with fistulas and lesser sacs were unqualifiedly applied to man. With the exception of comparatively isolated instances such as that of Alexis St. Martin and others, the only information regarding the human stomach was obtained by means of the stomach-tube and Roentgen-ray examinations.

Owing to the bulk of the stomach-tube and the marked discomfort occasioned by its use, it was impossible to follow the whole cycle of digestion and estimate step by step the exact changes which took place in the stomach after the introduction of a definite stimulus such as various foods. It is true that Hayem² was tireless in the application of the tube and attempted to remove specimens at intervals; but the irregularity of these periods and the inability to obtain subjects who would submit patiently to the repeated introduction of the tube were not the least among its objections. The wonder is that he accomplished as much as he did.

Fundamentally we have accepted Pawlow's statements until most of them have become unquestioned, but there is much to be said against results obtained by his procedures. Bourget,³ the French clinician, is not the only one who protests energetically against the application *sans question* of the results of animal experimentation to man. He says that the physiologist has a tendency to forget that the results which he registered are due to a function perverted or impaired by operative trauma such as fistulas or diverticula. The clinician should take them seriously into consideration, and study them with care, but by no means conclude that they are to be accepted unquestioned. Says Bourget, furthermore, "The physiology of digestion will not make any real progress from a clinical aspect until we have learned to use the sound to determine digestion under the most diversified conditions, but always with the stomach non-traumatized." Much can be said on the basis of this work to support that contention.

We have used a method which one of us⁴ devised and which has been described elsewhere by which it is possible to follow the entire cycle of gastric digestion with practically no discomfort and by which it is possible at any given moment to draw off any or all of the juice secreted in sufficient quantity to perform the necessary chemical examinations. We have already discussed⁵ the inadequacy of the ordinary stomach-tube and substantiated the statements of Harmer and

Dodd⁶ that the stomach-tube does not remove completely the gastric contents. The principle of our tube is entirely that of gravity and the tip is sufficiently heavy to seek the lowest portion of the stomach. Furthermore, it is slotted in such a way as to permit the aspiration of a representative sample of the gastric juice. These perforations represent the maximum bore of the rubber tubing. The instrument is inserted⁷ and left in the stomach for hours until the gastric cycle is completed.

We commenced our studies on healthy medical students and later performed the same test on hospital patients. Our studies represent in all over 100 cases. We used the straight Ewald meal consisting of two pieces of toast and 10 ounces of tea, 2 ounces of which were reserved to wash down the tube, although this was not necessary. The tube was introduced at the close of an Ewald meal and specimens collected every fifteen minutes. (During the first fifteen-minute period, specimens were collected at five-minute intervals.) This collection at fifteen-minute intervals was continued until the close of digestion, which was marked as pointed out elsewhere⁸ by (1) the failure to aspirate any further material; (2) the character of the preceding specimens; (3) the character of the murmur elicited by inflating through the tube and auscultating over the stomach, and (4) lavage, which enabled us to determine the presence of any food residues and their quantity. At first 10 c.c. specimens were obtained, but unless this material was thick, it was found that from 6 to 8 c.c. were sufficient for analysis.

Our method of analysis was that of Bourget's.⁹ The filtered material was collected and 1 c.c. measured off with an Ostwald graduated pipet. Titration was performed with hundredth-normal sodium hydroxid, phenolphthalein being used as an indicator for total acid and dimethylaminoazobenzene and the Sahli iodine method¹⁰ for free acid. The pepsin determinations were made by diluting 1 c.c. of each sample with 9 c.c. of 0.2 per cent. hydrochloric acid in a test-tube and adding Mettler tubes prepared by the Christiansen¹¹ method. The entire series of tubes was placed in the incubator for twelve hours, and the quantity of albumin digested was read off with the aid of a steel scale graduated in millimeters, and a dissecting-microscope.

Medical students absolutely free from any general or gastro-intestinal manifestation were selected as subjects and curves constructed from the data obtained as indicated above. It soon became evident that there was no such thing as a specific isolated curve, deviation from which indicated some pathologic condition. The following phases were considered of importance in the interpretation of the curve:

1. The period of "ascension." This usually occupied the first thirty minutes and indicated the rapidity and intensity of the response to a known stimulus.
2. The character and height of the high point or "acme," whether (a) accelerated or (b) retarded, and whether (a) abrupt or (b) sustained.
3. Period of descent or decline.
4. The character and modification of the food residues.

* From the Laboratory of Physiological Chemistry of Jefferson Medical College.

1. Pawlow: *The Work of the Digestive Glands*, 1910.

2. Hayem: *Maladies de la tube digestive*, Brouardel and Gilbert, 1905.

3. Bourget: *Maladies de l'estomac*, 1913, Ed. 1, p. 3.

4. Rehffuss: *Am. Jour. Med. Sc.*, June, 1914, p. 848.

5. Rehffuss, M. E.; Bergeim, Olaf, and Hawk, P. B.: *Gastro-Intestinal Studies. I. The Question of the Residuum Found in the Empty Stomach*, *THE JOURNAL A. M. A.*, July 4, 1914, p. 11.

6. Harmer, T. W., and Dodd, W. J.: *Sources of Error in the Use of the Stomach-Tube for Diagnosis*, *Arch. Int. Med.*, November 13, 1913, p. 488.

7. Rehffuss: *New York Med. Jour.* (to appear).

8. Bourget: *Maladies de l'estomac*, 1912, p. 57.

9. Sahli: *Diagnosis*, Ed. 1913.

10. Christiansen: *Ztschr.*, 1912, xlv. 257.

acidity is evident from the tables given under the hypersecretory type.

In the analysis of the curves many points must be considered. This method not only gives us a complete picture of secretory activity, but it also enables us to follow the evacuation of the material from the stomach and obtain an accurate index of its motor tone. Pathologically we can obtain an exaggeration or diminution of any or all the phases. We see likewise a prolongation of certain phases, particularly the descent out of all proportion to the normal. Further-

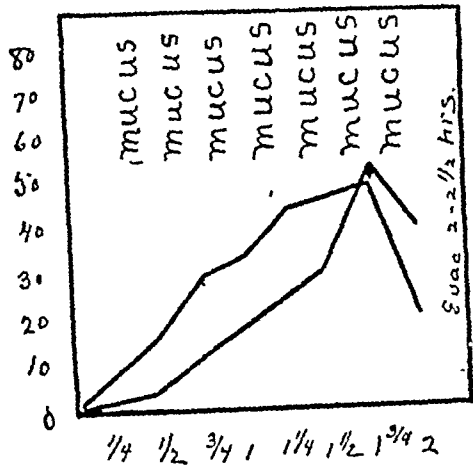


Chart 7.—Curves in two cases of chronic gastritis.

more, the character of the specimens is different, and added factors come into play such as mucus, blood, bacteria, food stagnation from previous meals, presence of organic acids, and distortion of the normal total and free acid ratio, each of which can be followed through the separate specimens. Our studies in pathologic cases are necessarily incomplete. To obtain data of value, many cases must be observed and compared. We feel the necessity of extended study along these lines, but wish merely to indicate the results obtained in certain conditions:

1. Two cases of duodenal ulcer: one undoubted, tender point, hunger-pain, persistent occult blood in the movement, the other with the same symptoms, tender point less pronounced, occult blood in the movements and in the duodenal lavage, not found in the stomach contents. The findings were as follows (Chart 6): (a) a rapid rise in half an hour; (b) distinct rather abrupt hyperacidity; (c) rapid decline; (d) rather rapid evacuation of food in one and three-fourths hours; (e) In one case hypersecretion, and (f) no occult blood in the gastric contents. The rapid evacuation is in keeping with the Roentgen findings in 40 per cent. of the cases. These cases are too few to judge the type of curve, but further work should yield interesting findings.

TABLE 4.—ANALYSES IN A CASE OF DUODENAL ULCER

Time	Total Acidity	Free Acidity
5 min.	8.5	4.0
10 min.	21.0	11.0
15 min.	25.0	17.0
1/2 hour	60.0	48.5
3/4 hour	70.0	51.5
1 hour	69.5	51.5
1 1/4 hours	52.0	36.5
1 1/2 hours	23.5	9.0
1 3/4 hours	20.0	7.5

2. Eight cases of gastroptosis which seem to indicate that there is no one type of curve or a single tendency in the elaboration of the secretion. On the hypersecretory, isosecretory and hyposecretory conditions are found engrafted depending on the inherent

tendency, the acquired and associated pathologic states of the mucosa. In the true Stillier type with generalized myasthenia there is a tendency to a late high point and impaired motility. Frequent small meals and tonic measures, including systematic exercises and a sea voyage, resulted in a total disappearance of subjective symptoms and an improvement in the curve as shown in the following case: The first curve showed a total acidity of 38 at one hour, 58 at one and three-fourths hours, a delay in motility to over three hours and hypersecretion. After the sea voyage, hypersecretion was still present, but the curve had practically reached its height in one hour, with a total acidity of 61, and remained sustained until the cessation of digestion in two and one half hours. There was still present, however, a hypersecretion. We believe that the study of the curve in these cases is of the greatest value from a therapeutic point of view, inasmuch as it enables us to appreciate the tendencies at work.

3. Four cases of chronic gastritis, with mucus in all samples, particularly the later ones, figures within normal range but usually low, evacuation normal, curve unbroken, high point late and slow in appearing (Chart 7 and Table 5).

TABLE 5.—ANALYSES IN TWO CASES OF CHRONIC GASTRITIS

CASE 7			CASE 8		
Time	Total Acidity	Free Acidity	Time	Total Acidity	Free Acidity
10 min.	1.5	.0	10 min.	2.0	.0
15 min.	7.5	4.0	20 min.	4.0	.0
1/2 hour	16.5	7.5	1/2 hour	5.5	trace
3/4 hour	32.0	29.0	3/4 hour	12.5	3.0
1 hour	36.0	27.5	1 hour	...	...
1 1/4 hours	46.0	36.0	1 1/2 hours	30.0	13.0
1 1/2 hours	48.0	37.5	1 3/4 hours	54.0	32.0
1 3/4 hours	49.5	40.0	2 1/2 hours	41.5	28.0
2 hours	21.5	...			

In Chart 8 and Table 6 is given the record of a case of hypo-acidity, atony and gastric catarrh showing distinct impairment of motility with very slow and retarded elimination of acid. There was outpouring of little acid and there were no previous food residues.

TABLE 6.—ANALYSES IN A CASE OF HYPO-ACIDITY

Time	Total Acidity	Free Acidity
10 min.	6.0	2.5
20 min.	6.5	4.0
30 min.	6.5	4.0
40 min.	8.0	5.5
50 min.	9.5	6.5
60 min.	10.5	8.5
70 min.	13.5	9.5
80 min.	17.0	11.0
2 1/2 hours	20.0	16.0
3 hours	17.0	14.0

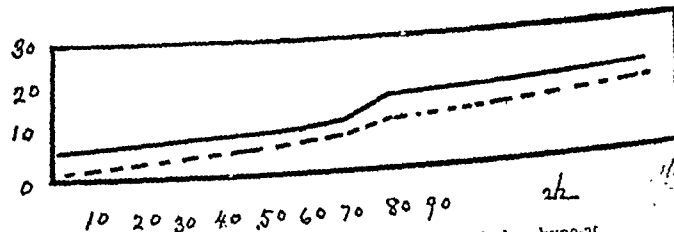


Chart 8.—Curve in chronic gastritis marked by hypo-acid impairment of motility.

4. Three cases of cholelithiasis with typical in which the attacks were followed patient was operated on for gall-st symptoms. The findings (Charts 7) were: (a) a late hyperacidity; (b) rapid evacuation; (c) rapid decline; (d) chemical evidence of stagnation o

(c) occult blood negative in different gastric samples and in feces. These findings, together with the anamnesis, should enable one to make the diagnosis.

TABLE 7.—ANALYSES IN TWO CASES OF CHOLELITHIASIS

CASE 9, HYPERSECRETION			CASE 10		
Time	Total Acidity	Free Acidity	Time	Total Acidity	Free Acidity
5 min.	5.0	.0	5 min.	5.5	3.0
10 min.	7.0	2.0	10 min.	5. (saliva)	...
15 min.	12.5	8.5	15 min.	25.0	13.5
1 3/4 hour	45.0	23.0	1 1/2 hour	28.5	22.5
1 hour	65.0	40.0	1 3/4 hour	51.0	36.0
1 1/2 hours	72.0	46.0	1 hour	70.0	45.0
2 hours	73.0	57.0	1 1/2 hours	75.0	59.0
			2 hours	58.0	44.0

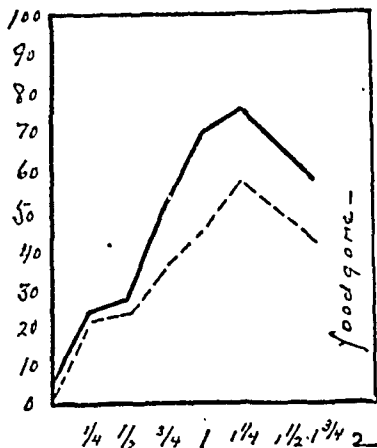


Chart 9.—Curve in cholelithiasis.

The tenderness over the gall-bladder region, the rapid evacuation, lack of gastric findings, symptoms, and pain independent of food, together with jaundice after the attack, enabled us to make a diagnosis in one of the cases. Diagnosis was unconfirmed by operation. In another case, old, operation was performed with removal of stones; drainage was employed, but there was recurrence of symptoms (adhesions?). Tetrachlorophthalein test in one case, although not conclusive, seemed to indicate some hepatic insufficiency.

5. Two cases of suspected neoplasm.

CASE 11.—There were pain, some epigastric tenderness four months in duration, loss of appetite and loss of weight, and no palpable tumor, in a woman past 50. This case showed no free acid, a total achylia without presence of pepsin or rennin, no lactic acid, no Oppler-Boas, doubtful occult blood reaction which on subsequent examinations was absent, negative Wolff reaction, albumin was found only in dilutions up to 1:80, and antipyrin reaction of the blood-serum was negative. Roentgen examination was absolutely negative as well as a physical examination, and on the basis of these findings the case was not considered one of malignancy. Pain has subsequently disappeared and the patient has gained 6 pounds by treatment. In this case is shown (Table 8, Chart 11) the rapid evacuation of the stomach in achylia.

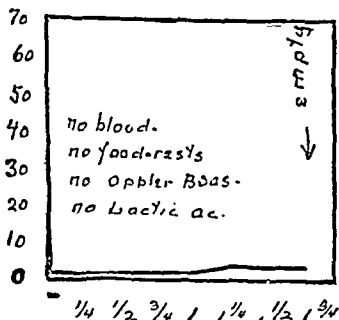


Chart 11.—Curve in achylia gastrica

diagnosis, and fluoroscopy by Dr. Pancoast showed an adhesion probably from the old gall-bladder scar to the duodenum.

Subsequent examinations have proved the correctness of the diagnosis, there being a constant reflux of bile in the stomach from adhesions right below the bile-duct.

TABLE 8.—ANALYSES IN CASE 11

Time	Total Acidity	Free Acidity
20 min.	1.0	.0
30 min.	3.0	.0
3 1/4 hour	2.5	.0
1 hour	1.0*	.0
1 1/4 hours	4.0	.0
1 1/2 hours	4.0	.0

* Saliva in sample.

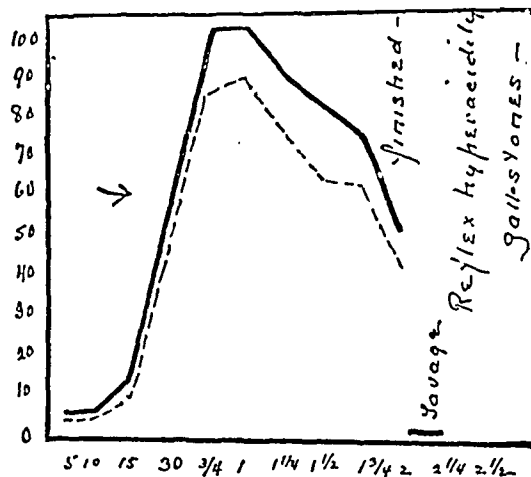


Chart 10.—Curve in reflex hyperacidity with gall-stones.

TABLE 9.—ANALYSES IN CASE 13

Time	Total Acidity	Free Acidity
5 min.	1.0	.0
10 min.	32.0	trace?
15 min.	2.0	.0
1/2 hour	15.0	.0
3/4 hour	29.0	.0
1 hour	6.0	.0
1 1/2 hours	15.0	.0

6. Two cases of carcinoma.

One (Case 13) operated on for annular carcinoma of the pylorus by gastro-enterostomy showed the very irregular results given in Table 9 probably due to the irregular working of the enterostomy. There was a trace of free acid in the second specimen but it could not be titrated. Throughout all the specimens were found blood, lactic acid and Oppler-Boas bacilli in large numbers as well as a variety of other organisms. Wolff test was positive at a dilution of 1:320.

The other case was a tumor on the lesser curvature, only partially obstructive, producing slight dilatation, and a gradually increasing curve up to 55; occult blood was distinctly positive.

7. A case (Case 14) with ulcer history and hyperacidity, symptoms improved on medical treatment. This case shows a typical hypersecretory curve, with hypersecretion with delayed motility, fat and vegetable residues from a meal ingested twelve hours previous to examination. Occult blood was negative. The case was probably one of healed contracted ulcer.

A study of this case alone is most interesting as it exemplifies what can be demonstrated by the frac-

tional method. The individual in question had an old ulcer history which was cleared up by medical treatment. At times he has outbursts of hyperacidity. The administration of an Ewald meal at 2 o'clock in afternoon six hours after a small breakfast gave the curve demonstrated in Tables 10 and 11 and Chart 12. At five minutes there is a distinct free and combined acid. This is not due to newly formed acid but to the hypersecretion which was present in minor degree. A new

débris and the outpouring of pure acid. Although the stomach was not empty at two and one half hours, it was of interest to see what effect the ingestion of water had in such cases. A new curve commences immediately, having the same general characteristics as the former curve.

Space does not permit us to give examples of the many interesting findings in functional conditions, the significance of which we are still in ignorance. One

point was repeatedly emphasized and that was the fact that the ordinary technic yields little information of value compared to this method. In the first place, it by no means records the high point in every instance, and secondly, it yields absolutely no information as to what has preceded or followed that point; in other words, it represents but one point in the ever-changing phases of the gastric cycle (Chart 13).

CONCLUSION

- 1. By means of the modified gastric tube, we

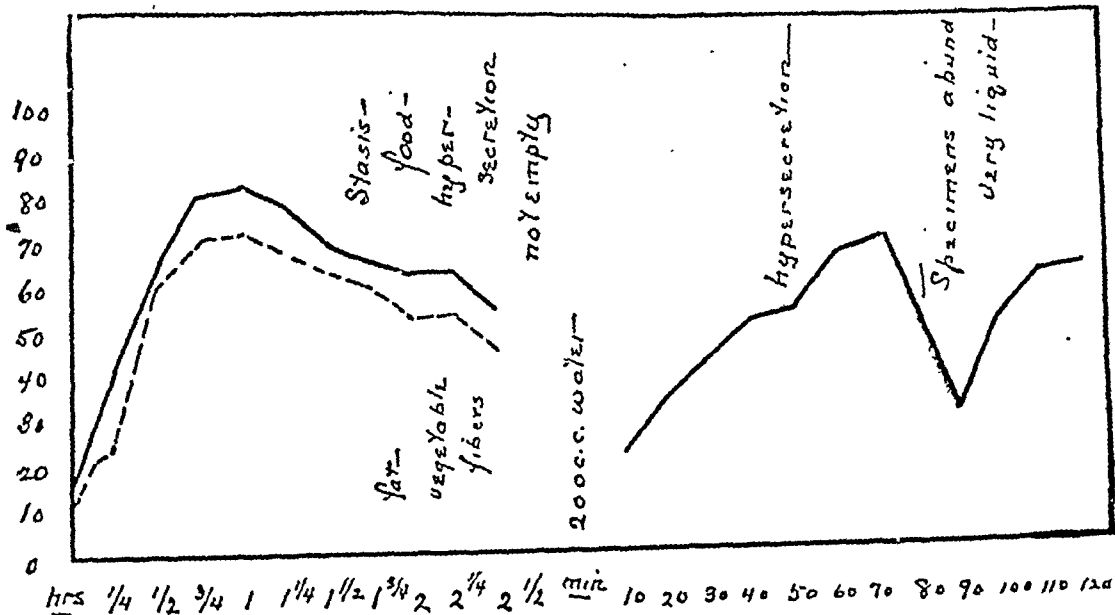


Chart 12.—Curve in healed ulcer.

TABLE 10.—ANALYSES IN CASE 14

Time	Total Acidity	Free Acidity	Mette
5 min.	17.5	13.0	1.00
10 min.	26.5	21.0	1.40
15 min.	42.0	26.0	1.40
1/2 hour	67.5	61.0	2.00
3/4 hour	82.5	72.0	2.50
1 hour	83.0	74.5	2.50
1 1/4 hours	79.0	...	2.20
1 1/2 hours	70.5	64.5	2.00
1 3/4 hours	67.0	60.0	2.30
2 hours	65.0	54.0	2.70
2 1/4 hours	64.5	56.0	2.10
2 1/2 hours	56.0	49.5	

TABLE 11.—ANALYSES IN CASE 14 AFTER THE INJECTION OF 200 C.C. OF WATER

Time	Total Acidity	Free Acidity	Mette
10 min.	21.0	19.0	1.50
20 min.	35.0	30.0	1.80
30 min.	32.5*	26.0	2.30
40 min.	51.0	42.5	3.50
50 min.	53.5	45.0	...
60 min.	68.0	58.0	...
70 min.	70.0	60.0	...
80 min.	47.5	39.0	...
90 min.	28.5	23.5	...
100 min.	54.5*	46.0	...
110 min.	62.5	53.5	...
120 min.	63.5	54.5	...

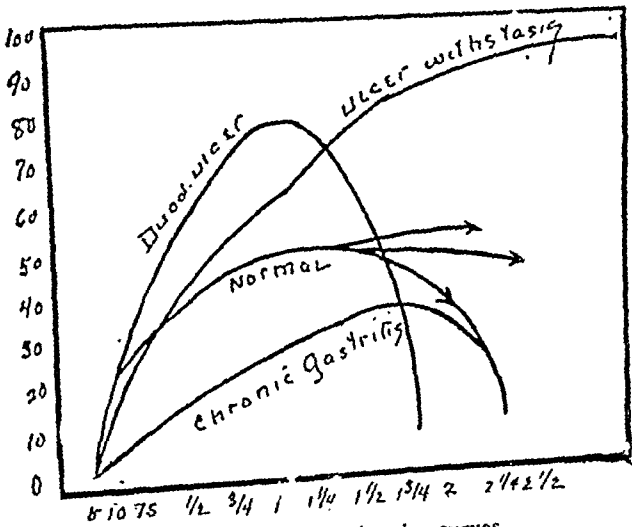


Chart 13.—Tendencies in curves.

curve commences, rapidly attaining its maximum, indicating excessive irritability of the glandular mechanism, and the specimens obtained, very liquid, show the excessive amount of juice poured out. Toward the end of the first curve every specimen shows large amounts of free fat ingested at the meal six hours before, and microscopic examination shows many vegetable fibers ingested about eighteen hours before. The curve falls, but the specimens preserve their appearance with a lessening amount of food

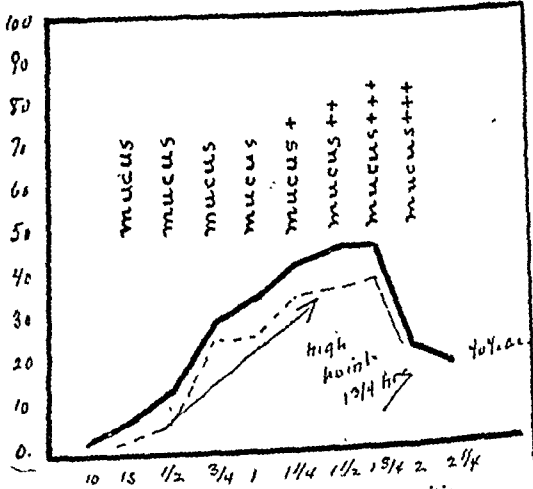


Chart 14.—Curve in chronic gastritis.

- can study the entire cycle of gastric digestion, recording both the secretory and motor activity.
- 2. We can construct a curve which graphically records the entire course of digestion.
- 3. Information as to the amount of the secretion can be obtained at any point by complete aspiration and by the character of the specimens which are obtained.
- 4. There is no specific curve for the normal person, but three types of curve can be found depending on

the rapidity of reaction to a given stimulus, the height of the curve and the descent of the curve.

5. These types may be termed, respectively, the hypersecretory, hyposecretory and isosecretory types, depending on their respective reaction to such stimuli.

6. Figures approximating those commonly regarded as hyperacidity are to be found in some period of the curve in a large number of normal persons.

7. A "continued" secretion is described in normal persons which is intimately linked with alimentary and chronic hypersecretion, but can be distinguished from them.

8. The value of this method in various pathologic states is emphasized and a limited number of cases are reported together with their findings.

9. The technic commonly employed for estimating gastric function is entirely inadequate, inasmuch as it indicates but one phase in a constantly changing cycle, and that phase is by no means always the high point in the digestive curve.

10. We would insist on the great advantages of this method which, correlated with the various tests performed on different samples as well as the special tests described elsewhere, enables us to make a more perfect study of the digestive cycle than has hitherto been possible.

We wish to thank Drs. McCrae, Hare and Cohen of the medical staff of the Jefferson Hospital, as well as Drs. Livingood and Wayland, the resident physicians, for their interest and cooperation in this work.

EXPERIMENTAL RESEARCHES IN METHYL ALCOHOL INHALATION *

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AND

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Notwithstanding the earnest efforts of the ophthalmologists and the various committees for the prevention of blindness, to disseminate the knowledge of the poisonous qualities and effects of methyl alcohol, it is still a lamentable fact that many members of the medical and legal professions and the vast majority of the laymen, especially the workers using it, are either ignorant of or do not acknowledge the truth. The effect on the eyes and general health from drinking wood alcohol has been proved experimentally in animals, and has been corroborated in clinical practice; but the effect from its inhalation alone on the eyes has never heretofore been demonstrated experimentally.

Although many clinical data have been collated tending to show an effect similar to the one obtained from its imbibition, many doubt and some dispute its power to affect the human organism deleteriously through inhalation alone. The wish to prove this fact, coupled with a desire in the interest of humanity to lessen the number of the blind and to conserve life, by advocating proper preventive or precautionary measures for

workers using it, induced us to undertake these experiments.

Before giving them in detail, it may be of interest briefly to refer to the importance of the subject to the body politic.

We have found that there have been about one hundred cases of amblyopia and death from inhalation of wood alcohol recorded in the literature to 1912, and we are of the opinion that this constitutes a very small percentage of the total number of cases which have actually occurred, as a great many either have not been recorded, or have gone unrecognized. Of those that have appeared in the literature, the question whether inhalation alone produced the condition, has usually arisen. In conducting our investigations, we have endeavored to exclude all possibility of the entrance of the wood alcohol into the system except by inhalation, and we feel sure that we have succeeded in producing amblyopia and death in that manner, as we contemplated at the beginning of these researches.

In 1880 about 400,000 gallons of wood alcohol were manufactured, while in 1910 the amount had increased to over 8,000,000 gallons; consequently it appears that the industry has become firmly established. That being true, it is for the chemists and medical profession so to arrange for its use or composition that, while it may serve its purpose in the arts and industries, it shall not levy too heavy a toll on the artisans, and indirectly on the state by causing blindness or death. Its use is extensive, about 2,000,000 people working in trades are using it in the United States alone, and as the foregoing figures indicate, its use is increasing annually.

According to the 1904 United States Census, the following industries and trades were using wood alcohol.

Painters, glaziers and varnishers...	278,000 workers
Launderers	386,000 workers
Boot and shoemakers.....	208,000 workers
Barbers	131,116 workers
Printers and lithographers.....	155,000 workers
Woodworkers—piano, furniture, etc.	112,000 workers

About 500,000 workers divided among dye-work operators, brass-workers, cabinet-makers, gold and silver workers, harness-makers, hat-makers, leather-workers and tanners, metal-workers, photographers, book-binders, chemists, etc.

The subject is one of increasing importance on account of the new employers' liability law in New York and other states. At present it is not even mentioned specifically as a hazard, but when the importance of the effect of its inhalation is realized, cognizance of this omission must surely follow.

The manufacturers assert that even admitting that commercial wood alcohol is poisonous, the refined product known as Columbian Spirits is not. We have proved conclusively that the refined spirit is quite as dangerous as the unrefined; and indirectly more likely to destroy vision and life on account of the absence of the disagreeable odor to warn one of its presence.

Our original intention was to note the effect of methyl alcohol inhalation in chronic cases, that is, in those which had been exposed to its influence in small quantities over a long period. But the time allowed in which to prepare our paper for the meeting was most inadequate to conduct our investigations along these lines, so we were obliged to confine our attention principally to the more acute phases of the matter under consideration.

* Read before the Section on Ophthalmology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

* Because of lack of space this article is abbreviated in THE JOURNAL by the omission of several experiments. The complete article appears in the Transactions of the Section and in the authors' reprints.

The apparatus used in our investigations consisted of a wooden box which was 32 cm. wide, 47 cm. long and 63 cm. deep (high) with an opening on each end about 1 cm. in diameter. In one end a mica valve was very delicately adjusted, allowing air to pass out. At the other end was an attachment for tubing which could be connected with an air-tank, or copper coil, and which acted as an inlet for fresh air. The top, in which were two square glass windows, could be fastened down by eight thumb-screws. The temperature of the air in the box for the experiments averaged about 68 F., while the hygrometric readings indicated an average of about 60 per cent., thus to a certain extent constituting conditions similar to those in which some of the workers with methyl alcohol use it, for example, varnishers in beer-vats, etc.

The wood alcohol used in the experiments consisted of both the commercial and the Columbian Spirits, and they were obtained from Eimer and Amend, chemists of New York City.

RESEARCHES IN METHYL ALCOHOL INHALATION IN ANIMALS

EXPERIMENT 1.—Acute poisoning in dog. Dec. 3, 1913: A dog, male, weight 4 kg., 700 gm. (about 10 pounds), fed one hour before experiment. At 4:15 p. m. was placed in the box with 2 ounces of wood alcohol on a sponge; inlet and outlet of box open for fifteen minutes during which time dog jumped and barked, then openings were closed. Room temperature 64 F. Interior of box temperature 70 F. Dog at 4:50 p. m. was lying quietly on his side. At 5:30 p. m. box was opened, dog appeared intoxicated; fell on attempt to walk. Moved his head from side to side.

December 5: Breakfast: meat and bread, at 11:30 a. m. At 4:30 p. m. dog was placed in box with 4 ounces wood alcohol on two sponges and box closed. At 4:40 p. m. dog was lying down, abdomen up, breathing heavily. At 4:50 p. m. dog's mouth was slightly open, tongue projecting and body in a position of opisthotonos, abdomen upward, animal moving fore feet feebly. At 5:05 p. m. dog unconscious, respiration 50 per minute. At 5:25 p. m. box opened; dog taken out apparently dying.

December 8: Dog recovered in thirty-six hours, and whereas on the 5th he was dull, he now appeared lively and well. Was placed in box with 5 ounces wood alcohol; box closed at 5:10 p. m. At 5:50 p. m. dog was taken out intoxicated, breathing heavily.

December 9: Dog appeared lively and well, and remained so.

December 30: Dog was placed in box with 5 ounces wood alcohol at 1:50 p. m. At 5:10 p. m. was observed lying on right side with tongue protruding and twitching of fore legs; was taken out of box. Examination: Temperature 90 F.; eye tension, Schiötz tonometer 26 mm. Hg, although its palpation seemed much lower, tonometer reading possibly little higher due to pressure of eyelids and to contraction of lid muscles; respiration 29 per minute, labored; blood-serum not alkaline to phenolphthalein; slightly alkaline to litmus; aqueous humor not alkaline to phenolphthalein; slightly alkaline to litmus; twitching of eyelids; cornea only slightly hazy; pupils 3 mm., no light reaction; fundus of eye, optic disk congested with edema; veins dark and dilated, arteries small.

December 31: Dog apparently dying; respiration 10.

Jan. 2, 1914: Dog found dead in morning.

Remarks.—This dog had four exposures to wood alcohol inhalation, spread over a period of one month. He died after the fourth exposure. It is interesting to note the continuous movements of the head from

side to side, which we venture to attribute to an irritation of the semicircular canals of the internal ear.

EXPERIMENT 5.—Effect of methyl alcohol inhalations, with and without ventilation. Dec. 18, 1913, at 4:05 p. m., a dog, weight 3,980 gm. (about 9 pounds), lively, eyes normal, was placed in box with inlet and outlet working. Through inlet air is pumped in at rate of 28 pumpings per minute under 2 pounds pressure. The air passes through a Woulfe bottle, which contains 3 ounces of Columbian Spirits. The vapor is thus forced through a copper spiral or coil placed in a pail of water, under which is a Bunsen burner to heat water and coil. After passing through coil it enters box warmed. At 5:05 p. m. dog was taken out of box lively and apparently unaffected.

December 20: Dog placed in box for twelve minutes. Experiment as before, allowing vapor to pass directly from Woulfe bottle into box without being warmed. Air-pressure $2\frac{1}{2}$ pounds—26 pumpings per minute. At 5 p. m. hygrometer in box, 40. After remaining in box $5\frac{3}{4}$ hours dog was lively, showing no apparent effect of vapor.

December 22: Condition as before. Dog in box from 12 m. to 3:30 p. m. having had 5 ounces of Columbian Spirits pumped in with no apparent effect.

December 27: Placed in box at 11:55 a. m. with $2\frac{1}{2}$ ounces wood alcohol pumped in under $2\frac{1}{2}$ pounds pressure; taken out at 5 p. m. lively; no apparent effect.

December 29: Through error of attendant, dog placed in box with 5 ounces wood alcohol without free ventilation. Examination at 4 p. m. found dog lying on right side, with tongue protruding, frothing at mouth, hair moist; was taken out of box. Respirations 20 per minute; deep reflexes absent; unable to stand; comatose.

December 30: Dog still comatose, lying on right side. Respiration shallow, irregular 50 per minute. Temperature 90. Eyes: tension from 6 to 8 mm., both corneae only faintly hazy; sensibility slightly diminished; pupils 3 mm. light reaction; aqueous humor not alkaline to phenolphthalein, neutral to litmus; fundus, optic disks red and edematous; arteries small, veins dark red and dilated. Blood-serum not alkaline to phenolphthalein, slightly alkaline to litmus.

December 31: Dog found dead in morning by attendant.

Remarks.—This experiment is a striking illustration showing the diminished resistance to the inhalation of Columbian Spirits when a very free ventilation was abolished. Moreover, we believe that the repeated exposures to the inhalation of Columbian Spirits (even with free ventilation) did have some effect on the dog, and that the last exposure had a quick fatal effect on account of the previous exposures.

EXPERIMENT 6.—Acute poisoning in rabbit. Dec. 13, 1913, a rabbit, weight 1,600 gm. ($3\frac{1}{2}$ pounds), was placed under a large bell jar with 5 ounces Columbian Spirits, and three minutes later was rubbing its nose. Respirations 50 per minute. Every seven or eight respirations spasmodic contraction of diaphragm resembling hiccup. At 4:55 p. m. respirations 32 per minute, with occasional convulsive rapid shortening of the body. Hygrometer 80. Taken from under jar at 5:05 p. m.

December 20: At 4:45 p. m. animal was placed under large jar with 5 ounces Columbian Spirits. At 5:45 p. m. respirations 40 per minute; hygrometer 70; taken out from under jar, not much effect shown.

December 23: At 3:40 p. m. animal under jar with 3 ounces Columbian Spirits. At 4:45 p. m. respirations 38; hygrometer 70; temperature in jar 68. Taken out in good condition.

December 27: At 11:55 a. m. animal under jar with 5 ounces Columbian Spirits. At 12:55 p. m. hygrometer 55; at 1:35 p. m. respirations 57. At 2:30 p. m. respirations 50. At 4 p. m. animal lying on side quietly; breathes regularly and deeply, 22 per minute. At 4:40 p. m. respirations 16;

at 4:45 p. m. respirations 4. Taken out from under jar; cornea hazy; no lid reflex; no light reflex; nose and ears cold. Temperature by rectum 90 F.

December 29: Found dead in morning. Eyes preserved in formaldehyd solution.

Remarks.—The rabbit appeared to be more resistant to the Columbian Spirits than the dog was. Coma and death came only after the fourth exposure, although relatively larger amounts of Columbian Spirits were used. The same spasmodic contractions of the body and diaphragm were noticed as in former experiments.

EXPERIMENT 8.—Acute poisoning in dog. Jan. 3, 1914, a dog, male, weight $5\frac{1}{2}$ kg. (12 pounds), was placed in box at 12:55 p. m., inlet and outlet closed; 5 ounces methyl alcohol commercial. At 1:50 p. m. animal staggered about, frothing at mouth, and at 2:50 p. m. was unable to stand; at 4:10 p. m. lying on right side; respirations 25, deep and labored. Dyspnea at 4:55 p. m.; respirations 24; pulse 150; eyes, cornea clear, sensibility diminished; pupils 2 mm. contracted; no light reaction; fundus, optic disks hyperemic, with edema; arteries small, veins dark, slightly dilated. Tension, left 18.5. Aqueous humor slightly alkaline to litmus, not alkaline to phenolphthalein. Respirations short; inspiration prolonged, expiration about as one to four. Hygrometer 55; temperature in box 66 F. Dog remained in comatose condition from January 3 to 5; was found dead the morning of the 5th, lying in same position as when examined on January 3 and 4.

Remarks.—Death was produced by one prolonged exposure (four hours). The intra-ocular pressure was not low January 3, soon after the exposure, and the animal lived more than twenty-four hours, a fact which confirms previous conclusions, namely, that when the tonometer shows a normal intra-ocular pressure, the animal, though in an apparently dying condition, will live at least twenty-four hours or more, and an intra-ocular pressure below 5 mm. Hg is a sign that death will follow within twenty-four hours.

EXPERIMENT 10.—Changes in the electroconductivity in the blood of a dog produced by methyl alcohol inhalation.

Jan. 17, 1914: Dog, weight 5 kg., 570 gm. ($11\frac{3}{4}$ pounds). Under ether anesthetization 15 c.c. of blood were obtained to which was added 5 c.c. of a 1 per cent. aqueous solution of ammonium oxalate. The electroconductivity was measured by Edelman's Universal Widerstands Brücke; see technic.¹

(1) Sample of dog's blood mixed with ammonium oxalate 3 to 1; (2) bridge reading, 39.4; (3) resistance out, 100; (4) temperature 9 C. (48.2 F.) = 65.017 ohms resistance at 9 C.; = 54.615 ohms resistance at 17 C. (62.6 F.).

January 20: Dog kept in box three hours with fumes from 5 ounces wood alcohol. Respirations 42, labored; at end of time lies on right side unconscious. Temperature below 94 F. Eyes: cornea slightly hazy; corneal and pupillary reflex abolished; fundus, edema of disks with dark veins; arteries small.

Blood was obtained from which the bridge reading was 34; resistance out 100; temperature 17 C. = 51.515 ohms resistance at 17 C. Dog killed with chloroform; eyes and optic nerves were enucleated and preserved in formaldehyd solution.

Post-mortem Examination.—Pericardium contained large amount of colorless transparent fluid which spurted out as if under pressure when it was incised; macroscopically heart appeared normal; stomach and intestines were dilated; interior of stomach and pylorus very markedly congested; cupful of frothy mucus found in stomach; spleen very dark indigo blue.

Remarks.—This experiment showed that the electroconductivity of the serum was increased after the inhalation of wood alcohol. The difference of 3.1 ohms resistance obtained in testing the electroconductivity of the blood showed a change which might result from the breaking up of the corpuscles, from an increase in H-ion content, or from any increase in the inorganic salts. An increase in the H-ion content will produce an increase in the acidity of the blood and also conduces to an edema of the tissues. As we find evidence in the blood of acidosis, and a tendency to edema of the ocular tissues, we think that the increase of its electroconductivity, following methyl alcohol poisoning, is due to an increase in the H-ion content of the blood.

EXPERIMENT 11.—Acute poisoning by inhalation in a monkey. Jan. 22, 1914: Female monkey in good health, weight 4 kg. (8.8 pounds), 1 per cent. solution of atropin instilled into eyes. Apparently did not like the bitter taste, as it evidently passed through nasal duct into mouth. It kept expectorating and washing out its mouth; gagged several times as if nauseated. Eyes: pupils dilated quickly and at maximum; fundi, periphery very dark, uniformly pigmented, no abnormalities; disks appear normal and are oval, long diameter vertical.

January 29: Temperature 102 F. per rectum. Monkey placed in box with 3 ounces methyl alcohol spread over sides of box. At 4:25 p. m. air pumped in under $2\frac{1}{2}$ pounds pressure thirty times per minute. Monkey sat in one corner opposite air inlet and no apparent intoxicating effect was produced whatever; at 5:10 p. m., wood alcohol, 1 ounce additional introduced into box; at 5:25 p. m., taken out; monkey acts normally.

February 3: General condition good. At 5 p. m., in box with 3 ounces wood alcohol; same condition; temperature 100.6; at 5:50 p. m., taken out, temperature 100.2 F.

February 4: At 1:35 p. m., in box; temperature 101.4; out at 3:15 p. m., temperature 102; staggering gait, acted dazed and slightly intoxicated. Three ounces wood alcohol used, box with open ends.

February 5: At 2:55 p. m., in box; temperature 102; out at 4 p. m., temperature 100.6. Three ounces wood alcohol used. At 3:35 p. m., animal winking; slight watery discharge from nose.

February 6: At 2:45 p. m., in box; temperature 101.6; out at 3:45 p. m., temperature 101.6.

February 7: At 3:05 p. m., in box; temperature 102; out at 4:30 p. m., temperature 102; 3 ounces wood alcohol placed on cotton, high up, near top of box; monkey not affected apparently by vapor.

February 9: At 3:15 p. m., in box; temperature 102; out at 4:15 p. m., temperature 102; no effect. Wood alcohol 3 ounces.

February 10: In box at 2:55 p. m., temperature 102; out at 4:40 p. m., temperature 100; pulse 160; optic disks hyperemic as compared with first examination; veins dark; pupils dilated, sluggish to light, acts sleepy. Wood alcohol 3 ounces.

February 11: At 3 p. m., in box; wood alcohol 3 ounces; temperature 102; out at 4 p. m., temperature 101.6; staggering gait, weak hind legs; eyes red and watery; drowsy, falls forward in attempting to walk.

February 12: At 10:20 a. m., in box; temperature 101; out at 11 a. m., temperature 99. Wood alcohol 3 ounces.

February 12: At 4:10 p. m., in box; temperature 103; out at 4:20 p. m., temperature 102; vomited, much affected, scarcely able to walk; hygrometer 65.

February 13: At 9:45 a. m., in box with 5 ounces wood alcohol; temperature 100.4; out at 10:45 a. m., temperature 100; drowsy; much affected; very weak, nausea, vomiting. At 4 p. m., temperature 98.8; acts ill, face, gray pallor, refused to eat chocolate, of which was very fond. Keeps quiet; eyes red, pupils dilated, surface of body cold;

1. Centralbl. f. Electric., 1887, p. 115.

wrapped up in covers, sits with head down between fore legs; placed in room by warm radiator.

February 14: At 8 a. m. found dead; body warm, apparently just died. No evidence of painful death. Head removed, eyes enucleated. Necropsy at 5 p. m. macroscopically. Pancreas and adrenals normal; kidneys slightly congested; liver slightly darker than normal, uniform color, no apparent degeneration; uterus and ovaries normal. Heart, pericardium slightly congested; empty; no blood clots nor fluid. Lungs normal, crepitate and float; spleen small, indigo color characteristic of wood alcohol cases; preserved in formaldehyd solution. Large intestines very much inflated containing also mass of feces and a thrombus in the intestinal mucosa. Small intestines not much bloated; empty of fecal matter but in upper part sections or links bloated with occasional dilatation of vessels; stomach contains yellowish-green tenacious semifluid homogenous mass of mucus with small pin-point hemorrhages along vessels, with dilated veins; dura markedly and pia mater slightly congested; spinal cord appeared normal.

Remarks.—The shortness of time of inhalation with free ventilation, and the small amount of wood alcohol used, explain the lack of effect on the monkey during the first two exposures. But this lack of effect was only apparent, as the animal began to show weakness of hind legs, loss of appetite, diarrhea and vomiting after the subsequent exposures. That death followed the last exposure, in which 5 instead of 3 ounces of wood alcohol were used, is very significant. We are convinced that a latent debilitated condition which was not recognized, existed, and the last dose acted fatally as an overdose. The pin-point hemorrhages on the gastric mucosa is one of the characteristics of wood alcohol poisoning.

EXPERIMENT 13.—Acute poisoning in dog by inhalation of Columbian spirits, with marked ocular hypotension. Feb. 28, 1914: Dog, weight 5 kg., 900 gm., male. At 8:35 a. m., in box with 10 ounces Columbian Spirits; temperature 102.6; out at 11:15 a. m. In box at 12 m., out at 3:20 p. m., temperature 96. In box six hours; during first hour frothed at mouth; required about one hour to be intoxicated, then comatose; at 4 p. m., respirations 28; auscultation showed short inspiration with long expiration; pulse 88 by stethoscope; temperature below 93. Some fibrillary contractions of muscles of face, mouth, neck, nose and tongue. Intra-ocular pressure less than 3.5 mm. Hg with Schiötz tonometer. Not much bleeding during enucleation, but more than when commercial wood alcohol was used; bleeding stopped readily (viscosity increased, coagulation time reduced). Died one hour later as expected, using the marked hypotension as an indication of the proximity of death. The examination of the ocular fluids showed a marked reduction in alkalinity.

EXPERIMENT 14.—Changes in chemical reaction of serum and aqueous humor. March 3, 1914: Female dog, weight 5 kg., 800 gm. Aqueous humor withdrawn by aspiration under cocain anesthesia. Four-tenths c.c. obtained from left eye. Alkaline: $48 - 47.90 = 0.10$; acid: $28.10 - 28 = 0.10$; result, neutral to phenolphthalein.

March 5, 1914, 10 a. m.: In box; temperature 101; out at 12:30 p. m. In box 12:45 p. m., with 5 ounces Columbian Spirits; out at 4 p. m., temperature 95. Eyes: pupils 3 mm.; 5 p. m.—O. D., tonometer=3.5; O. S.=3.5; (blood examination morning and evening). Died next day as indicated by very low hypotension. Right eye, aqueous 0.4 c.c. Titrated with phenolphthalein as an indicator. Alkaline: $32.4 - 29.5 = 2.90$; Acid: $31.10 - 29.95 = 1.15$; Alkaline: $2.90 - 1.15$ acid=1.75 alkaline=4 c.c.; 4.48 tenth normal sulphuric acid to 1 c.c. Normal blood-serum 0.1 acid=1 c.c. Blood normal 0.5 c.c. Twenty c.c. water. Alkaline:

$33 - 32 = 1.00$; acid: $31.95 - 31 = .95$; alkaline $1.00 - \text{acid } 0.95 = .05$ alkaline. One c.c.=0.1 blood tenth normal sulphuric acid to phenolphthalein. Serum taken in morning.

Blood after exposure to Columbian Spirits vapor: Alkaline: $23 - 22 = 1.00$; acid $32.85 - 32.00 = .85$; alkaline $1.00 - \text{acid } .85 = .15$ alkaline. One c.c. blood-serum=0.15 tenth normal sulphuric acid.

Remarks.—As we see, the serum of the dog before inhalation was 0.10 tenth normal sulphuric acid; aqueous humor was neutral; serum after inhalation was 0.15 tenth normal sulphuric acid; aqueous after inhalation was 4.48 tenth normal sulphuric acid. It is very significant that the aqueous shows more acidity than the blood.

EXPERIMENT 15.—Control. Feb. 3, 1914: Male dog, weight 3 kg., 300 gm., was placed in box as control with inlet and outlet open (no methyl alcohol vapor added). Animal was kept in box four hours. No apparent effect; was active and lively when taken out.

February 7, 9:55 a. m.: In box, temperature 103.4; out at 1:15 p. m., temperature 102.6; box closed tight, no ventilation; when taken out box contained bad (close) odor. Dog showed no bad effect.

EXPERIMENT 16.—Acute poisoning with Columbian Spirits showing acidity of aqueous humor and increased viscosity of blood. March 7, 1914: Male dog, weight 6 kg. (about 12 pounds), in box with 10 ounces Columbian Spirits. At 9:30 a. m., in box; temperature of dog 104; out at 1:45 p. m., temperature 97. At 2:45 p. m., in box; temperature 95; out at 4:15 p. m., temperature 94. Pupil contracted to 2 mm.; no reaction to light; dog comatose; aqueous withdrawn with needle, 0.7 c.c. Alkaline: $24.00 - 23.00 = 1$; acid $34.85 - 34.00 = 0.85$; alkaline, $1.00 - \text{acid } .85 = .15$; 0.7 c.c.=0.15. One c.c.=0.21 tenth normal sulphuric acid to phenolphthalein as indicator.

Remarks.—As normal aqueous showed neutral reaction, this test is interesting on account of acid reaction as determined.

March 9, 9:30 a. m.: Temperature 96.4; animal comatose; pulse 20; respiration 6. Pupils 2 mm., contracted; no light reaction. Corneal reflex abolished, anesthetic; O. D., fundus hyperemic and edema of optic disk; arteries small, veins not altered in size. At 4:30 p. m., temperature 95 F.; respiration 6; pulse 20. O. D. enucleated and placed in 5 per cent. formaldehyd solution for microscopic examination, no bleeding during operation until optic nerve was severed, then slight hemorrhage occurred, about 1 dram dark viscous blood which coagulated readily. Surface of body cold; respirations slow and deep; eyes closed; tongue dry and protruding; animal comatose; pupil, no light reaction—tonometer 3 by palpation, all reflexes abolished; animal in moribund condition.

March 10: Found dead at 8 a. m. Necropsy: Brain reddish; meninges and substance of brain (white and gray matter) congested. Lungs, pleural cavity contains about 2 c.c. sanguineous fluid, surface of left lung shows numerous small hemorrhages; lung substance slightly edematous and floats on the surface of water. Trachea, normal, not congested. Heart, full of dark blood-clots. Spleen, dark indigo-blue throughout. Liver and bile both darker than normal. Kidneys, bluish-red, very dark, much congested. Adrenals and pancreas darker than normal. Stomach, empty; numerous small punctate dark purple hemorrhages along lesser curvature. Intestines, bloated and empty, purplish-red, similar to lining of stomach.

Remarks.—The symptoms, chemical reactions of the aqueous and post-mortem findings we consider typical of acute poisoning with methyl alcohol.

3. Blood-serum 1 c.c.=0.05 increased acid in case after Columbian Spirits.

2. When tension is less than 5, dog usually dies within 24 hours.

BLOOD-COUNT IN DOG WITH ACUTE POISONING BY INHALATION OF METHYL ALCOHOL

Before inhalation:

○ Erythrocytes	5,700,000
Leukocytes	11,800
Hemoglobin	90 per cent.
Polymorphonuclears	79 per cent.
Lymphocytes	21 per cent.

After inhalation (2½ hours):

Erythrocytes	7,800,000
Leukocytes	28,600
Hemoglobin	100 per cent.
Polymorphonuclears	99 per cent.
Lymphocytes	1 per cent.

Remarks.—Besides the increase in the erythrocytes, leukocytes, hemoglobin and polymorphonuclears, the very marked decrease in the lymphocytes is of decided interest.

MICROSCOPIC FINDINGS IN EYES OF DOG WITH SUB-ACUTE POISONING

HEMATOXYLIN EOSIN AND VAN GIESON

1. Choroid gives the impression of hyperemia.
2. Tapetum normal. Retina: rods and cones and the external nuclear layer normal.
3. Outer reticular layer slightly edematous.
4. Inner nuclear layer, normal.
5. Inner reticular layer, slight edema.
6. Ganglion cells swollen and surrounded by clear areas, the nuclei being displaced far toward the periphery.
7. Inner layers of the retina show some edema.

WEIGERT

1. The medullary sheath of the optic nerve takes Weigert's stain rather weakly.
2. A few vacuoles show at the ends of the rods and cones. The Marchi and Nissl specimens have not been finished, the report of these will be published later.

We consider methyl alcohol to be a true hemato-toxic. It has a decided effect on all tissues, producing degenerations, and under certain conditions amblyopia or death. In the eye it produces first a toxic edema of the tissues, which, with the increased viscosity of the blood, interferes with its free circulation. The tissues, being deprived of their nutrition and oxygen, succumb to the effect of the toxin, and degeneration of the ganglion cells and nerve fibers ensues. Acidosis occurs as indicated by the results of the titration of the aqueous and serum, and by the determination of the electroconductivity of the blood.

The tension of the eye in methyl alcohol coma may be a guide as to the immediate outcome of the case, and with more study a scale might be formulated giving exact points at which, as regards life, one could prognosticate complete recovery or death.

Hypotension of 5 mm. Hg or less indicates death within twenty-four hours, while with tension over 5 the animal lived longer; and in these cases a question arises whether or not, if proper treatment was instituted early, the animal would recover.

SUMMARY

Effects of experiments with methyl alcohol inhalation were the following:

1. In nose and mouth copious discharge and frothing.
2. Temperature: marked fall, varying from 1 to 10 degrees according to amount used, method and time of exposure to vapor.
3. Respiration: rate increased, then decreased below normal, being very low just prior to death and ceasing before heart.

4. Blood: increase in electroconductivity due to an increase in H-ion content. Increased acidity, with phenolphthalein as an indicator. Coagulation time reduced, specific gravity increased. Viscosity increased. Erythrocytes, leukocytes, hemoglobin and polymorphonuclears increased and lymphocytes decreased.

5. Necropsy findings: Stomach: empty, mucous membrane congested, punctate hemorrhages. Trachea: pale. Lungs: few minute hemorrhages on surface. Heart: muscle dark, in some cases cavities, empty. Liver: dark. Kidneys: dark purple, congested. Adrenals: hemorrhage in one case. Spleen: dark indigo-blue. Intestines: bloated, small punctate hemorrhages. Brain: marked congestion of the meninges.

Effects on the eyes were: Slight irritation producing blinking, slight haziness of cornea and no inflammation of conjunctiva. Corneal reflex retained in some animals after others had disappeared. Fundus: Hyperemia and edema of the disks, with dilated, dark veins and arteries. Pupil: Moderate contraction in coma, with loss of light reaction. Tension varies with intensity of toxemia, in mild recoverable cases being normal, and in profound coma showing marked hypotension, which when less than 5 mm. Hg by tonometer, indicated a rapid and fatal termination within about twenty-four hours.

Aqueous by titration (with phenolphthalein as an indicator) showed an acid reaction.

In one dog (Experiment 9) blindness was noticed, judging from the animal's collision with objects when attempting to walk, as he could not see to get around them.

Microscopic findings indicate an edema of the tissues with very early signs of beginning degeneration of the ganglion-cell layer of the retina.

In reviewing the results of these experiments, attention is directed to the similarity with those obtained through experimental researches and clinical observations, in the internal administration of methyl alcohol; thus demonstrating its fatal and profound toxicity irrespective of the method of its entrance into the animal organism.

The contentions of the manufacturers that the refined methyl spirits are absolutely harmless are untenable and may cause many sad results among workmen by rendering them careless in taking proper precautionary measures while working with it. Many consider its inhalation harmless under ordinary ventilation. We take exception to that supposition. Most of our inhalation clinical cases result from its toxicity under what are considered by the workmen ordinary conditions. While ventilation will diminish the intensity of the toxicity, the inhalation will not be rendered absolutely harmless thereby. Not ordinary ventilation, but the very best obtainable is required for workers using wood alcohol. At least three times the ordinary air-space allotted per person should be allowed to each workman using it. Placards warning of the poisonous properties of wood alcohol should be posted in conspicuous places about premises where it is used, and hours of labor should be so arranged as to allow for exercise in the open air at frequent intervals. In our subacute cases while the exposure to the vapor for an hour or two daily had not much apparent untoward effect at the time, it certainly did have an effect which manifested itself later by subsequent weakness, trembling and unsteady gait in the intervals between expos-

ures. We are inclined to agree with M. L. Poincaré,⁴ who found, after exposing animals to small quantities of vapor of methyl alcohol over a period of from eight to sixteen months, that considerable fatty degeneration of tissues occurred, especially in the liver, heart, muscle, epithelial cells of the uriniferous tubules, some cells of the lungs, and with congestion and slight inflammation of the meninges, and of some nerve centers. He concluded that the vapor of methyl alcohol in small quantities was dangerous.

Physicians often fail to recognize industrial and occupational diseases because of the fact that they are often masked under the form of chronic disorders, which show themselves in obscure diseases of the digestive tract and nervous system, and are attributed by patients to other causes. A number of cases of methyl alcohol poisoning, to our knowledge, have occurred in which the causes of death were given as pneumonia, meningitis, heart-disease, etc. Many of the milder cases have been treated for chronic gastritis, hepatitis, etc. It is not surprising that these unfortunate persons travel from one physician to another searching for relief, when we consider the unfortunate but sad truth that many physicians fail to grasp the true etiology of the cases.

That a difference in susceptibility to methyl alcohol exists in animals and man cannot be denied, and this can be partly explained by the rate of oxidation which takes place in the animal or person. Those in which it is rapidly oxidized experience the least effect, while those with slow oxidation feel the greater toxic effect. Harnack⁵ concluded that methyl alcohol in slow oxidation formed formic acid, while in rapid oxidation carbon dioxid and water were formed. Hence when it is rapidly oxidized, it is comparatively (?) harmless, while in slow oxidation, which usually occurs in man, it is exceedingly toxic, as the action of the formic acid thus produced in the animal organism was much stronger than that of the pure formic acid introduced into the body, as in the latter case the organism attempts to convert it with bases and thus gives rise to formates.

In 1869 Richardson⁶ suggested that methyl alcohol be inhaled as an anesthetic. He stated that 2 ounces required one hour to produce anesthesia, and pointed out that reflex irritability was not abolished by small doses, that the temperature of the body was reduced 3 degrees and that the danger from its use was practically nil; but when inhalation was forced, death was produced by simultaneous cessation of respiration and circulation. We do not know the time required for him to gain the knowledge contained in the last sentence, but trust that it was during his very early use of methyl alcohol.

It is a well-recognized fact in pharmacology that poisons which affect the highly differentiated nerve-structures very powerfully are proportionately more dangerous the more highly developed the nervous system of the animal is, hence it would be expected that man would be relatively more susceptible to such a poison as methyl alcohol than would the dog or rabbit.

The results of the experiments with the titration method agree with the conclusions formed by Greg-

nolo,⁷ who determined, after the ingestion of methyl alcohol, that there was an increase in the concentration of H-ions in the aqueous and serum, and who stated that these changes go parallel with the morphologic changes in the tissues of the eye. His experiments show, as do ours, that the substances produced in the body by poisoning with methyl alcohol are extremely diffusible and penetrate the eye readily. Our microscopic specimens having been obtained from acute cases show only the stage of edema with an indication in the ganglion cells of one of the first signs of degeneration, the location of the nucleus being far toward the periphery of the cell and most of the cells showing this change. As to the fate of methyl alcohol in the human body, Pohl⁸ found that it underwent the same change as in that of the lower animals, its administration leading to the appearance of formic acid which is slowly excreted in the urine.

R. Hunt⁹ states that experiments on the physiologic action of methyl alcohol show conclusively that, however pure the preparation may be, it is totally unfit for use as a substitute for grain alcohol in any preparation which is to be taken internally or used externally, or, we add, which may be inhaled in a concentrated form.

USE OF SPECIALLY DENATURED ALCOHOL RECOMMENDED

Only those who have had experience realize the power and intensity of the opposition encountered in endeavoring to obtain proper protective legislation for the regulation of the sale and use of methyl alcohol. When it is possible for one or two members of a legislative body working in the interests of methyl alcohol manufacturers to be able to thwart the wishes of the vast majority of the inhabitants of a great state for a just protective law regulating the safe and proper labeling of methyl alcohol, it is a most unjust and deplorable state of affairs. If the law regulating the sale of specially denatured alcohol could be amended so that manufacturers might be permitted to sell this alcohol to the individual trades using it in the various industries, which would allow them to prepare their own varnishes, etc., obtaining the consistency desired, one of the objections to its present use would be overcome. The variety of denatured alcohol which the law now compels them to use contains a denaturing agent which renders the varnish of soft consistency, and after having dried it scratches very easily, leaving a white mark. If the trades could obtain the denatured alcohol without the objectionable denaturing agent (benzin, pyradin, etc.) it would in a short time supplant the methyl alcohol to a great extent, as it is only one-tenth as dangerous, and if it is used in an exceedingly well-ventilated space, the fatal results due to the toxicity of methyl alcohol would be reduced to a minimum.

The laws relating to methyl alcohol should be enforced with a jail sentence as a penalty attached. Until the gravity of the situation is realized by our law-makers and the judges in our courts, a certain number of manufacturers who value human life cheaply will continue to be a menace to society by disregarding the law and thus causing blindness and death.

4. Poincaré: *Compt. rend. Acad. d. sc.*, 1878, p. 682.

5. Harnack: *Deutsch. med. Wchnschr.*, xxxviii, 358.

6. Richardson: *Med. Times and Gaz.*, 1869, p. 703; *London Med.* 1875, pp. 62-77-93.

7. Gregnolo: *Klin. Monatsbl. f. Augenh.*, 1913, p. 157.

8. Pohl: *Arch. f. exper. Path. u. Pharmacol.*, 1893, p. 181.

9. Reid, Hunt: *Bull. Johns Hopkins Hosp.*, xiii, Nos. 137-138.

TREATMENT

While heretofore treatment, except in a very small proportion of the cases of methyl alcohol poisoning with amblyopia, has been considered rather hopeless, the few patients who have improved or recovered, should stimulate us in our efforts to go forward with renewed vigor in search of a plan of medication which shall yield better results. A plan of treatment based on our findings might be summed up in two words, eliminate and stimulate. Eliminators of all varieties should be used, namely, emetics, hydragogue cathartics, diuretics and diaphoretics, calomel, jalap, pilocarpin hypodermatically, hot saline baths or packs, saline infusions and high saline enemas. Stimulants such as strychnin, caffeine and theobromin would produce stimulation with diuresis. Ammonia and oxygen inhalation may be used to supply the alkalines and to aid in oxidation. Sodium iodid and alkaline waters would aid in reducing viscosity of the blood and the medicinal treatment may be supplemented by applying heat to the body and extremities.

Credit is hereby given and our sincere thanks extended to Professors Lee, Scott and Pike for their kindly assistance and advice tendered in these researches, which were made in the physiological laboratory of the College of Physicians and Surgeons, Columbia University, New York, also to Mr. Edward Burchell, for his kind assistance in preparing and mounting the microscopic specimens and to Drs. Dixon and Holden for their kindness in examining our specimens.

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ABSTRACT OF DISCUSSION

DR. WARD A. HOLDEN, New York: The clinical symptoms following the inhalation of wood alcohol are so identical with those following its imbibition that it was to be expected that laboratory experiments would give the same results in each. The defense in a recent suit for damages was based on the fact that there was in the literature no experimental proof that the inhalation of wood alcohol could cause blindness. The proof has now been supplied by this painstaking investigation, and an inspection of sections of the retinas of animals so poisoned reveals the same degeneration of the ganglion cells that I found a dozen years ago in animals after the imbibition of wood alcohol. When hundreds of thousands of dollars are invested in an industry it naturally is difficult to bring about safeguards and restrictions that might in any way diminish the sales of the product. The New York Committee for the Prevention of Blindness of which I am a member, believes that in time something may be accomplished. The subject was studied at some length and then a campaign of education was started in the lay press which it was hoped would render it easier to secure the legislation we desired. Hundreds of newspapers took up the matter and many trade journals treated it editorially. The varnish trade and the brewers especially were favorable. We were attacked chiefly by the perfumery-trade journals, which was to be expected, since the great majority of perfumes and toilet preparations are made up with wood alcohol. The National Brewers Association asked us to furnish them an exhibit for their last annual meeting and they sent out to the brewers of the country some thousands of reprints of our literature. For several years past suits for damages for blindness or death in varnishers in the brewery vats have been uniformly successful, and in the last case of which I have knowledge a man in Brooklyn whose eyesight had been impaired received \$12,000 from a brewing company in settlement of his claim because they feared to have the case go to a jury. Our efforts to have wood alcohol and preparations containing it labeled poison have failed in the New York state legislature and in the New York City Board of Alder-

men. The New York Department of Health, however, of whose advisory council I am a member, is about to add an ordinance to the sanitary code to prevent the use of wood alcohol in any preparation intended for internal or external use by man, and to have wood alcohol and its preparations bear the regulation poison label. The suggestion has been made in the paper that a specially denatured grain alcohol, without benzin or pyridin, be permitted to be used in the preparation of varnishes. This would seem to be a good suggestion. The denatured grain alcohol statute has almost entirely failed of its intended purpose. Denatured alcohol has not come into general use as a cheap and relatively harmless solvent, because of the restrictions thrown about its sale and of the necessity of using denaturing agents which render it more or less unfit for use in certain industries, so that the more expensive and more toxic wood alcohol, sold everywhere without restrictions, is generally used.

DR. HIRAM WOODS, Baltimore: The difficulty in securing the conviction of persons selling wood alcohol is great everywhere. This past winter I had an experience with a man blind from wood alcohol. There was no difficulty in procuring the liquor and showing that it contained 30 per cent. of wood alcohol, sold as Sherwood whiskey. The man who sold it was arrested. The Maryland law provides that anyone who sells wood alcohol to be used as a beverage is guilty of a misdemeanor. The Italian liquor-dealer said he bought it from a jobber and had not himself put the wood alcohol in. Then the judge decided that since the saloonkeeper had said he had not done it, it was up to the State Board of Health to hunt up the jobber and trace it back. This was impossible. The man was acquitted. We should have the legal department of the American Medical Association prepare us a model law. It is a state matter, of course, but it is extremely difficult to get a law fixed without some flaw that leaves these rascals out.

EDGAR B. BURCHELL, New York: On Dr. Schoenberg's suggestion I made an investigation of the blood-count of a rabbit at various intervals after it had been given 8 c.c. of methyl alcohol subcutaneously. The results are shown in the accompanying table. You will see there is quite a difference between the blood picture of the rabbit and the dog. There was no ocular effect at all in the rabbit. By careful physical examination of the rabbit there were no discernible changes in the physical signs. The findings are based on cell-counts of 500 in each instance.

DIFFERENTIAL LEUKOCYTE COUNT

	Normal, Per Cent.	1½ Hrs. after, Per Cent.	2½ Hrs. after, Per Cent.	17 Hrs. after, Per Cent.	20 Hrs. after, Per Cent.	25 Hrs. after, Per Cent.	38 Hrs. after, Per Cent.
Sm. mononuclear	42.4	68.4	66.4	74.8	55.2	77.4	80.0
L. mononuclear..	2.0	4.4	1.6	2.4	3.6	2.8	0.6
Transitional	0.0	0.0	0.6	0.2	0.8	0.2	0.0
Polynuclear	54.8	22.8	28.2	18.4	32.4	16.4	18.0
Eosinophil	0.2	2.0	3.0	2.8	6.2	2.0	0.8
Mast cells	0.6	2.4	0.8	2.0	1.8	1.2	0.6

DR. M. J. SCHOENBERG, New York: We have observed in our animals continuous movements of the head together with uncertain gait which we think are due to some changes in the internal ear, and for that reason I think it would be worth while in a case of such poisoning for some otologist to examine the function of the internal ear, which has never been done before. Another point is that rabbits exhibit greater resistance than dogs to wood-alcohol poisoning by either inhalation or imbibition, which agrees with the findings of Reid Hunt. The findings of Dr. Burchell would explain this somewhat. A dog placed in a box with 5 or 10 ounces of wood alcohol will become unconscious and remain so from twenty-four to forty-eight hours or more. A rabbit resists this. The changes in the blood of the dog compared with those in the blood of the rabbit explain partly why the dog is more sensitive than the rabbit. I think the most important point is the post-mortem findings in animals as compared to

human beings after wood-alcohol poisoning. I had the fortune to be present at a post-mortem on a girl who had drunk liquor containing wood alcohol and died thirty-six hours later. The post-mortem findings were almost exactly the same as in the animals—dogs and a monkey—namely, congestion of the brain, some meningeal hemorrhages, empty heart, hemorrhages in the pleura and pericardium, congestive patches and hemorrhage in the stomach. The patient also complained of impaired hearing several hours before she died.

The examination of the intra-ocular pressure might also help in the prognosis of these cases. We found in the dog that whenever the intra-ocular pressure, after the administration of wood alcohol, is below 5 mm. mercury, the dog died within twenty-four hours. I think that is a point to be considered in wood-alcohol poisoning.

There are two and a half million men working in industries which make and use wood alcohol and I think that there are quite a few of them suffering from the consequences of daily inhalation of wood alcohol. The clinical picture of this occupational disease has not yet been worked out. Judging from our experiments, the clinical symptoms would be nausea, vomiting of blood, headaches, disturbance of vision produced by slight toxic edema of the retina and optic nerve, and they ought to be looked for, together with some changes in the blood. I do not know any one who has made a systematic examination of the blood in such patients.

The greater acidity of the aqueous humor, as compared with that of the serum, after inhalation of wood alcohol is of considerable interest, since this apparent contradiction throws some light on the secretory function of the ciliary body. In view of the facts brought out by this paper, the sale of wood alcohol must be prohibited entirely for the external as well as for the internal use on the human body. I see no reason why wood alcohol should be kept and sold in drug-stores, where people buy it in good faith that it is a "tonic" when used as a rub.

A STUDY OF THE ARNETH FORMULA*

GRAHAM E. HENSON, M.D.

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Since Arneth¹ in 1904 suggested his classification of polymorphonuclear neutrophils as a guide in the prognosis of infectious diseases, while there have been a number of contributions by other authors, their work in applying the classification has been largely confined to tuberculosis, although Kagan² has reported his findings in cases of sepsis. In the Arneth classification the polynuclears are divided into five classes depending on the number of nuclei contained within the cell. Taking the blood from a large number of healthy persons he determined that in the normal person a fairly constant relative percentage of the cells was found in each of the five columns (Table 1). An

TABLE 1.—THE ARNETH CLASSIFICATION

Column	1	2	3	4	5
Percentage	5	35	41	17	2

increase in Columns 1 and 2 with a corresponding decrease in Columns 3, 4 and 5, he termed a shift to the left, the normal Arneth index, comprising the totals of Columns 1 and 2, being 40.

* Read before the Section on Practice of Medicine at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.
1. Arneth, Joseph: Die neutrophilen weissen Blutkörperchen, Jena, 1904.
2. Kagan, S. H.: Nuclear Classification of the Neutrophil Leukocytes and Its Relation to Disease, Boston Med. and Surg. Jour., 1910, clxii 709.

Bushnell and Treuholtz³ adopted the method of adding one half of the number contained in Column 3 to those in Columns 1 and 2. In the series which I now report I have preferred to take as an index the number in excess of the normal count in Columns 1 and 2; thus, a total of 50 in these columns is reported as plus 10. In classifying the neutrophils I have adhered to the rules set by the majority of previous investigators, nuclei being joined by a thread being counted as two, while those connected by a distinct isthmus were counted as a single nucleus. The greatest care has been maintained to avoid the counting of superimposed nuclei, which would result in causing a false shift to the left; when it was extremely difficult to determine with any certainty the column in which to place a cell, it was discarded. In making the differential counts, two hundred cells have been counted, and a similar number of polynuclears used in arriving at the Arneth formula. Wright's stain has been used in all instances with satisfactory results. To facilitate the technic in securing the differential count and Arneth index at the same time, a pad ruled as in the accompanying blank form was used.

1	2	3	4	5

Polys.	Large Lymp.	Small Lymp.	Large Mono.	Eosin.	Baso.	Trans.

Blank form used in recording differential count and Arneth index.

As the white cells are counted a check is placed under the proper heading, the polynuclears put in their respective columns, according to the number of nuclei, with a total of 200 cells counted, the differential count determined and a sufficient additional number of polynuclears counted to bring their number to 200, thus arriving at the Arneth index.

In Series A (recorded in Table 2), consisting of thirty-one unselected cases taken from the surgical service of Dr. Raymond C. Turck at St. Luke's Hospital, a total and differential white cell-count is not recorded. Cases 2, 5, 6, 9, 12, 13, 14, 18, 19, 20, 21 and 27 all showed decided shifts to the left. All of these were septic cases excepting Cases 6, 14, 21 and 27, Case 6 being a case of trifacial neuralgia in an unhealthy person, Case 14 one of exophthalmic goiter, Case 21 a compound fracture of the tibia accompanied by severe shock, and Case 27 a clean hernia, the latter showing a very decided eosinophilia; but the patient escaped from observation before further investigation of a possible causative factor could be conducted. In Case 18, epithelioma of the lower jaw with a plus index of 7.50, the patient succumbed a few weeks after admittance. The other nineteen cases in this series showed practically normal indexes, all of them clean surgical cases excepting Case 4 with a superficial sepsis recovering in two weeks, Case 8, a case of multiple fistulas recovering in three weeks, and Case 22, a case of cancer of the penis showing no recurrence eight

3. Bushnell, G. E., and Treuholtz, C. A.: Arneth's Method in the Clinical Study of Pulmonary Tuberculosis, Med. Rec., New York, 1908, lxxiii, 471.

months later. In contradistinction to the pictures in these cases attention is called to Cases 2, 5, 9, 12, 13 and 20, all of which had decided plus indexes and a slow convalescence.

Series B also consists of forty-two cases from the surgical service of Dr. R. C. Turck. The clean surgical cases only serving as a control were not used after a sufficient number had been obtained for this purpose. This series is, then, largely from selected cases. Table 3, the record of cases in Series B, in addi-

after operation. Cases 1, 6, 18, 27 and 40, in which there was no shift, were of a nature that would lead us to expect one. It is significant, however, that three of these are in children, which, together with the blood-picture in Case 20, an infant, indicates that the Arneth formula, like the general blood-picture, is subject to a wide variation in infants and young adults.

In a further series of twenty-five cases of pulmonary tuberculosis I have been able to confirm the findings of Arnold C. and Henry Klebs,⁴ Minor and Ringer⁵

TABLE 2.—RECORD OF CASES IN SERIES A

Case No.	Age	Diagnosis	Treatment	Disposition	Arneth Count					
					1	2	3	4	5	Shift
1	7	Fracture of femur.	Lane plate; primary union.....	Cured	4.5	36.5	42.0	14.5	2.5	1.0
2	33	Septic cholecystitis.	Cholecystectomy, followed by infected wound in adipose tissue.	Cured, convalescence 2 months.	11.5	36.0	40.5	11.0	1.0	7.5
3	41	Ventral hernia ...	Intestinal resection; end-to-end anastomosis; repair of hernia.	Cured	8.0	27.0	50.0	12.0	3.0	...
4	50	Multiple stab-wounds, head, face, back and pleura; several infections.	Repaired by suture; drainage.....	Discharged cured in 2 weeks.	5.5	34.0	44.0	13.5	3.0	...
5	27	Ruptured appendicular abscess; general peritonitis.	Drainage; proctoclysis	Discharged cured in 6 weeks.	10.0	38.5	37.0	13.5	1.0	8.5
6	65	Facial neuralgia...	Deep injection of alcohol.....	Discharged improved in 4 weeks.	14.0	32.0	46.5	5.5	2.0	6.0
7	25	Varicocele	Radical operation	Cured	7.5	28.0	43.5	16.5	4.5	...
8	52	Multiple fistulas...	Internal and external urethrotomy; prostatectomy.	Discharged cured in 3 weeks.	7.0	31.5	37.5	21.5	2.5	...
9	45	Rectal fistula; ischiorectal abscess.	Radical treatment on 4 occasions..	Discharged cured in 8 weeks.	14.5	34.5	38.0	12.0	1.0	9.0
10	7	Fracture of femur clavicle.	Splints and plaster dressings.....	Cured	8.0	27.0	46.0	15.0	4.0	...
11	40	Hemorrhoids	Radical operation	Cured	8.5	28.5	46.0	12.5	4.5	...
12	38	Left inguinal hernia; appendicular abscess.	Radical operation for hernia; drainage of abscess.	After draining pus 5 weeks, discharged cured.	20.5	29.0	37.5	11.5	1.5	9.5
13	33	Multiple urethroscrotal fistulas.	Incision, resection, drainage, etc....	Discharged cured in 5 weeks.	19.0	34.0	32.5	9.0	5.5	13.0
14	42	Exophthalmic goiter.	Radical operation; primary union..	Cured	14.0	37.5	37.0	9.5	2.0	11.5
15	33	Fracture of femur.	Splints and plaster dressings.....	Cured	9.0	28.0	47.0	12.0	4.0	...
16	35	Appendicitis; Lane's kink.	Appendectomy; adhesions broken..	Cured	6.5	34.0	41.0	12.0	6.5	...
17	43	Fibroid uterus....	Hysterectomy	Cured	8.0	28.5	48.0	12.0	3.5	...
18	35	Epithelioma superior and inferior maxillaries.	Curet and cautery.....	Died 4 weeks later.....	10.5	37.0	41.0	9.0	2.5	7.5
19	33	Gangrenous appendix.	Radical operation	Cured	15.0	34.0	41.5	7.0	2.5	9.0
20	36	Empyema gall-bladder.	Cholecystectomy	Discharged cured in 3 months.	21.0	39.0	34.0	5.0	1.0	20.0
21	20	Compound fracture tibia; multiple superficial injuries.	Lane plate	Cured	19.5	28.5	37.5	10.5	4.0	8.0
22	68	Cancer of penis..	Amputation	No recurrence 8 months later.	7.0	28.0	48.5	13.0	3.5	...
23	35	Ventral hernia and fecal fistula.	Intestinal resection, 7 feet 5 inches of intestines.	Improved	6.0	23.5	44.5	19.0	7.0	...
24	2½	Fracture of humerus.	Splints and plaster dressings.....	Cured	9.5	33.5	48.5	6.0	2.5	3.0
25	24	Compound fracture of tibia.	Bone graft; primary union.....	Cured	17.5	27.5	45.5	7.0	2.5	5.0
26	12	Hypospadia	Plastic operation.....	Cured	9.0	30.5	45.5	12.0	3.0	...
27	12	Inguinal hernia; hydrocele cord; scrotal hydrocele.	Radical operation	Cured	16.0	44.5	34.0	5.5	.0	20.5
28	53	Inguinal hernia...	Radical operation	Cured	13.5	26.5	50.5	7.5	2.0	...
29	30	Perineorrhaphy and trachelorrhaphy.	Radical operation	Cured	7.5	29.5	51.5	9.0	2.5	...
30	11	Lacerated hand..	Repair of tendons.....	Cured	6.0	32.5	45.5	12.5	3.5	...
31	34	Fibroid of uterus.	Hysterectomy	Cured	9.5	31.0	46.0	10.5	3.0	...

* In Case 13 the patient was colored; all the others were white persons.

tion to giving the Arneth index, records the total white cell and the differential counts. Cases 2, 7, 8, 11, 13, 17, 19, 20, 22, 23, 25, 28, 29, 30, 31, 32, 35, 36 and 37 all show decided shifts to the left. All of them were septic cases excepting Cases 20 and 22, Case 20 being an inguinal hernia in an infant 2 years old, and Case 22 a carcinoma of the stomach, the patient deserting and being lost to observation. In the series, Cases 7, 24, 31 and 35 with plus indexes of 38, 3, 30 and 18.5, and Case 42 with a normal index, succumbed shortly

and Cummings,⁶ in which they found a decided shift to the left in unfavorable cases.

4. Klebs, Arnold C., and Klebs, Henry: Hematological Studies in Tuberculosis, *Am. Jour. Med. Sc.*, 1906, cxxxii, 538.

5. Minor, C. L., and Ringer, P. H.: Arneth's Method of Blood-Counting—Its Prognostic Value in Pulmonary Tuberculosis, *Am. Jour. Med. Sc.*, 1911, cxli, 638. Ringer, Paul H.: A Further Study of the Prognostic Value of Arneth's Leukocytic Blood-Picture in Pulmonary Tuberculosis, Based Upon 729 Counts in 475 Patients, *Am. Jour. Med. Sc.*, 1912, cxliv, 561.

6. Cummings, R. S.: The Arneth Blood-Count in Pulmonary Tuberculosis, a Report of Eighty Cases, *California State Jour. Med.*, 1913, xi, No. 7, p. 286.

TABLE 3.—RECORD OF CASES IN SERIES B

Case No.	Age	Diagnosis	Treatment	Disposition	Differential Count						Arneth Count							
					Total White Cell Count	Polys.	L. Lymph.	S. Lymph.	L. Mono.	Eosin.	Baso.	Trans.	1	2	3	4	5	Shift
1	10	Compound fracture of left femur; closed fracture right femur; laceration on back with infected urinary fistula.	Abduction frame; late operation on left femur.	Complete cure in 7 months.	12,000	78.0	2.0	6.5	3.5	8.0	2.0	.0	7.0	30.5	47.0	12.0	3.5	...
2	10	Osteomyelitis of both tibiae; extensive superficial ulceration; positive Wassermann.	Curettage and antisyphilitic treatment.	Very much improved; nearly healed; still under treatment.	12,500	63.0	7.5	20.0	2.0	5.0	1.5	1.0	9.5	37.0	40.0	10.0	3.5	6.5
3	30	Fracture of fibula.	Lane plate	Cured	8,000	68.0	3.0	19.5	2.5	6.0	1.0	.0	8.0	30.5	47.0	11.0	3.5	...
4	9	Double talipes; equinovarus.	Tenotomy; osteotomies.	Cured	9,000	47.5	3.0	40.5	2.5	5.5	.0	1.0	4.5	28.0	55.5	9.0	3.0	...
5	35	Acute appendicitis.	Radical operation	Cured	19,000	69.5	18.0	8.5	3.0	1.0	.0	.0	7.0	29.5	45.5	10.5	7.5	...
6	40	Rectal fistula; ischio-rectal abscess.	Radical operation	Cured in 4 weeks.	8,000	56.0	8.5	30.0	1.5	2.0	.0	.0	7.0	33.5	46.0	8.5	5.0	...
7	38	General peritonitis.	Laparotomy; drainage	Died 12 hours later.	18,000	24.5	14.5	28.0	3.0	.0	.0	.0	30.0	30.5	47.5	19.0	2.5	38.0
8	36	Septic cholecystitis.	Laparotomy; drainage	Cured in 7 weeks.	22,500	79.0	5.0	13.0	2.0	.0	.0	.0	22.0	46.0	29.0	2.5	.5	28.0
9	39	Endocervicitis; lacerated perineum.	Trachelorrhaphy and perineorrhaphy.	Cured	7,000	67.5	5.0	26.5	1.0	.0	.0	.0	5.0	34.5	39.5	14.5	6.5	...
10	42	Luetic necrosed tibia.	Curettage; specific treatment.	Cured	7,500	72.0	3.0	19.5	2.5	2.0	1.0	.0	7.5	36.0	38.5	12.5	5.5	3.5
11	35	Infected ununited compound fracture of tibia.	Resection of necrotic bone.	Still under treatment.	8,500	77.0	6.0	15.5	1.0	.5	.0	.0	10.5	38.0	39.0	8.5	4.0	8.5
12	33	Chronic appendicitis and prolapse of uterus.	Appendectomy and fixation of uterus.	Cured	9,000	53.5	6.0	26.0	3.5	7.5	2.5	1.0	9.5	29.5	44.0	12.5	4.5	...
13	35	Double salpingitis.	Radical operation	Cured	10,000	66.0	6.0	21.5	2.5	2.0	.0	.0	18.0	36.5	37.5	5.5	2.5	14.5
14	14	Acute appendicitis.	Appendectomy	Cured	6,000	55.0	6.5	22.5	4.5	9.5	.0	.0	2.0	12.5	26.0	44.5	11.5	5.5
15	37	Endocervicitis.	Trachelorrhaphy	Cured	9,500	68.5	5.0	21.0	2.5	1.0	.0	.0	9.0	33.5	49.0	5.5	3.0	2.5
16	26	Acute appendicitis.	Appendectomy	Cured	10,500	49.5	8.5	39.0	.5	1.0	1.0	.5	3.5	28.5	49.0	16.0	3.0	...
17	12	Extensive burns followed by infection.	Open air; sunlight; skin graft.	Cured	10,000	58.5	5.0	34.5	1.0	1.0	.0	.0	17.0	38.5	40.5	3.0	1.0	15.5
18	30	Extensive burns followed by infection.	Placental graft	Improving	8,000	61.0	8.0	24.0	2.0	3.0	.0	.0	6.0	35.5	48.5	8.0	2.0	1.5
19	60	Urinary fistula secondary to suprapubic prostatectomy.	Resection	Cured	8,500	64.5	7.5	25.5	.5	1.0	1.0	.0	10.5	41.5	43.5	4.0	.5	12.0
20	2	Inguinal hernia.	Radical operation	Cured	15,000	26.5	4.5	64.5	3.0	1.0	.0	.5	20.5	36.5	39.5	1.5	2.0	17.0
21	6	Hernia; hydrocele	Radical operation	Cured	10,000	52.5	7.0	30.5	3.0	6.5	.0	.5	5.0	33.0	45.5	12.5	4.0	...
22	30	Carcinoma of stomach.	Resection of rib and drainage.	Deserted	8,000	49.0	11.0	35.0	2.0	1.5	.0	.5	10.5	39.5	45.0	3.5	1.5	10.0
23	45	Empyema	Resection of rib and drainage.	Unimproved	10,000	72.0	10.5	14.5	.5	.0	.0	.0	2.5	19.5	43.0	31.0	5.5	1.0
24	55	Myelitis	Laminectomy	Died	15,000	79.5	7.5	8.5	.5	.0	.0	.0	4.0	7.0	36.0	44.5	8.5	4.0
25	28	Extensive abscess, neck and jaws, secondary to decayed tooth.	Drainage, 3 weeks.	Cured	18,000	85.5	6.5	2.0	3.5	.5	.0	.0	18.5	43.5	29.5	6.5	2.0	22.0
26	31	Palmar abscess.	Drainage, a few days.	Cured	8,000	66.5	5.5	22.0	2.0	2.5	.5	1.0	10.0	30.5	46.5	10.0	3.0	.5
27	16	Osteomyelitis of tibia.	Curettage	Improved	12,000	57.0	10.5	23.5	2.0	6.0	1.0	.0	9.5	33.5	39.5	14.5	3.0	3.0
28	30	Appendicular abscess; general peritonitis.	Drainage, etc.	Cured in 4 weeks.	18,000	78.5	4.0	12.5	4.0	.5	.0	.5	14.5	37.5	39.0	5.0	4.0	12.0
29	20	Actinomycosis lower and upper maxillary; positive uncinaeasis.	Curet and drainage; thymol.	Still under treatment.	9,000	34.0	8.0	17.5	2.0	11.5	2.0	5.0	21.0	46.5	26.5	4.0	2.0	27.5
30	28	Empyema	Resection of rib; drainage.	Still under treatment.	25,000	83.0	1.5	13.5	1.0	.0	1.0	.0	15.5	54.5	24.5	4.5	1.0	30.0
31	13	Ruptured appendicular abscess; general peritonitis.	Drainage, etc.	Died	15,000	83.0	6.0	6.5	2.5	2.0	.0	.0	20.5	49.5	25.0	4.0	1.0	30.0
32	25	Celulitis of arm, shoulder and hand resulting from infected finger.	Drainage	Cured	10,500	77.0	2.0	19.5	1.0	.0	.5	.0	20.5	48.5	27.5	3.0	.5	29.0
33	17	Spastic paralysis with deformity.	Drainage	Improved	11,000	57.0	3.0	27.5	.5	7.0	2.5	2.5	3.0	37.0	46.5	10.5	3.0	...
34	33	Multiple varicose ulcers of leg.	Tenotomies and resection of knee-joint.	Cured	9,000	48.0	5.5	40.0	2.5	3.0	1.0	.0	5.5	40.5	46.0	5.5	2.5	6.0
35	36	Empyema of gall-bladder; perforation; general peritonitis.	Resection of ulcers, etc.	Cured	9,250	69.0	9.5	12.5	1.0	1.5	.0	.65	16.5	42.0	32.5	6.5	2.5	18.5
36	36	Septic cystitis.	Laparotomy; drainage	Died	12,600	83.0	4.5	5.5	.0	3.0	1.0	.0	15.5	40.5	39.5	2.5	2.0	16.0
37	31	Acute appendicitis.	Radical operation	Cured	7,000	70.0	4.0	20.0	3.5	.5	2.0	.0	13.5	32.5	45.5	4.0	4.5	6.0
38	24	Acute appendicitis	Radical operation	Cured	9,000	78.0	7.5	10.5	2.0	2.0	.0	.0	4.0	35.0	51.5	7.5	2.0	...
39	28	Acute appendicitis	Radical operation	Cured	7,800	72.0	8.5	15.5	2.0	1.5	.5	.0	5.0	30.5	56.0	6.0	2.0	...
40	10	Pott's disease	Spinal jacket	Under treatment; improving.	9,000	76.5	4.0	15.5	1.0	2.0	1.0	.0	8.0	32.0	51.5	4.5	4.0	...
41	42	Chronic cholecystitis of 10 years' standing.	Cholecystectomy	Died from acute pancreatitis 48 hours after operation.	6,000	63.5	3.0	25.5	2.0	4.0	.0	2.0	6.0	33.0	51.5	6.5	3.0	...
42	28	Chronic appendicitis	Appendectomy	Cured	7,200	69.5	4.0	22.5	1.5	2.5	.0	.0	5.5	34.0	52.5	4.5	3.5	...

* In Cases 3 and 22 the patients were colored; all the others were white persons.

In a smaller series of typhoid fever cases I also found a shift to the left in severe infections, while in malaria fever and pellagra there seems to be no change from the normal Arneith picture. I hope to have the opportunity to report in detail on this work at some future time. My findings up to the present would lead me to think that in certain classes of cases the Arneith index is of some prognostic value, enough so at least to warrant a careful and intensive study of the blood-picture in all septic and infectious diseases.

I wish to acknowledge my deep appreciation to Dr. Raymond C. Turk, chief surgeon of St. Luke's Hospital, for the privilege of studying the blood of his patients, and for many other courtesies extended to me while the work was in progress.

THE DESICCATION TREATMENT OF CON- GENITAL AND NEW GROWTHS OF THE SKIN AND MUCOUS MEMBRANES*

WILLIAM L. CLARK, M.D.

PHILADELPHIA

I have undertaken during the past six years some experimental and clinical studies with high-tension electric currents, for the purpose of determining their value relative to the reduction of congenital and neoplastic growths. The practicability of utilizing such currents for producing a thermic action of just sufficient intensity to devitalize tissue by dehydration was described by me before another section¹ of this association in 1912. This method has been developed to a higher degree of efficiency since that time, and additional facts concerning it realized. It has proved so satisfactory in my hands that I take the liberty of again calling attention to it and of presenting a series of pictures to show some of the results obtained.

The field of application is limited to accessible neoplasms, as of cutaneous surfaces and such mucous membranes as the mouth, throat, larynx, conjunctiva, bladder, urethra, vagina, uterine cervix and rectum.

The advantages of desiccation are as follows: 1. Accessible abnormal tissue may be destroyed rapidly and effectively and the operation is bloodless. 2. It is a method of precision. A small point may be destroyed without infringement on normal tissues, as may an area of large size and considerable depth. 3. No needle or other instrument is inserted into the growth. 4. The current has an anesthetizing property, which renders application bearable. 5. There is a devitalizing action on cells of less vitality than normal cells somewhat deeper than the desiccated area, leaving the normal cells intact. 6. There are sterilization and rapid repair. 7. Blood- and lymph-channels are sealed,

which lessens the likelihood of metastasis in cases of malignancy. 8. The cosmetic result is good, as shown by the absence of contracted cicatricial tissue.

There are no disadvantages, other than the expense and cumbersomeness of necessary apparatus.

THE DESICCATION METHOD

Heat effects as applied to living tissue range in degree from simple hyperemia to carbonization. Somewhere between these extremes there is a point the effect of which is more than hyperemia and less than carbonization, which is called the desiccation point. If this accurate caloric degree is produced, controlled and sustained, it will cause rapid dehydration of the tissue desired to be devitalized, rupturing the cell capsule and transforming it into a dry mass; in other words, just enough heat is generated to destroy tissue without actually carbonizing it. Substances such as soap, potato and tissues, cadaveric and living, may be desiccated through a sheet of white paper without charring or discoloring the paper, and the transformed matter pulverized between the fingers. The correctness of the desiccation principle has been acknowledged by physicists, and I claim for it a new principle for application to surgery.

Instrumentation.—Static apparatus, twenty-four plates, twelve made of fiber 33 inches in diameter, and an output of, at least, 3 milliamperes of current, and twelve of glass 38 inches in diameter. Five horsepower motor to propel fiber plates, these plates being capable of approximately 2,000 revolutions a minute. Two Leyden jars, each of 0.00042 microfarads' capacity, used in conjunction with a resonator or surge-coil, the inductance portion of which has forty turns $3\frac{1}{2}$ inches in diameter, of 25 gage Brown and Sharp copper wire. The surge end of the coil has ninety turns of the same size wire, same diameter of turns. These careful measurements are necessary for a proper balance between the capacity, inductance and the resistance.

Technic.—A Leyden jar is connected with each pole of the machine. The resonator or surge-coil is interposed between them and connected with each jar, thus completing the circuit. One end of the resonator is grounded. A wire is carried from the side of the resonator not grounded to the desiccation applicator. This applicator is supplied with a make-and-break device by means of which the current is controlled at will. A fine needle is inserted in the end of the applicator and kept in place by means of a thumb-screw. The speed of the plates, which controls the current strength, is regulated according to the size and depth of the area desired to be destroyed. This is not done by set rule, but by knowledge gained from technical experience. The rods of the static machine are then separated until the discharge of sparks assumes a characteristic formation, which is known as the point of critical resistance. The patient should lie on a low operating-table or reclining-chair. The operator sits and rests his elbow against the side of the table with his wrist on the part of the patient adjacent to the area to be treated, to insure a steady hand. For superficial dehydration, the needle-point is not brought in direct contact with the tissue, but an air-space varying from 0.25 cm. or less to 2 cm. is interposed between them. The electron waves are thrown from a metal point and projected to the tissue in the form of a fan-shaped

* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Clark, W. L.: High-Frequency Desiccation, Fulguration and Thermoradiotherapy, Their Uses in Therapeutics, *THE JOURNAL A. M. A.*, Sept. 21, 1912, p. 916.

Other contributions to the subject by the author are as follows:

The Destruction of Surface and Cavity Neoplasms by Desiccation, a New Electrical Effect; Preliminary Report, *New York Med. Jour.*, June 10, 1911.

High-Frequency Desiccation, Its Uses and Limitations in Surgery and Dermatology; a Second Report, *Month. Cycl. Prac. Med.*, August, 1912.

Electrical Desiccation as an Adjunct to Surgery, with Special Reference to the Treatment of Cancer, *Surg., Gynec. and Obst.*, August, 1912.

The Uses of Electric Desiccation, Fulguration and Thermoradiotherapy in Surgery, Supplementary Volume, *Keen's System of Surgery*.

efflux of sparks following one another with such rapidity that to the eye the appearance is that of a luminous glow. When deep destruction is desired, the patient is grounded and the needle is brought in direct contact with the tissue. The placing of the operator's hand on the patient at a point opposite the area under treatment adds to the capacity, and helps to concentrate the current; this is usually sufficient without grounding. It matters not which pole is used, as this current is unlike the galvanic current, which has electrolytic or chemical properties, and polarity must be considered, whereas the desiccation current from either pole is purely thermic in action. The unaltered current from the static machine cannot be used for desiccation, but it must undergo a physical transformation analogous to the metamorphosis of a volume of water into spray or steam. This is done by introducing into the circuit the Leyden jars and resonator as described.

DIFFERENTIATION BETWEEN DESICCATION AND OTHER ELECTROSURGICAL METHODS

1. Desiccation (Clark).
2. Electrolysis; synonyms, ionic surgery, cataphoresis (Massey).
3. Fulguration (DeKeating Hart), non-destructive.
4. Diathermy (Nagelschmidt), synonyms, thermopenetration, thermocoagulation.
5. Fulguration (destructive); synonym, high-frequency cauterization.

1. Desiccation (Clark) devitalizes by dehydrating the tissues.

2. Electrolysis destroys tissue by the chemical or electrolytic action of the galvanic current.

3. Fulguration (DeKeating Hart) does not directly destroy tissue, but it is asserted that when long high-tension sparks are applied to the field in malignant disease after radical operation, alteration of nutrition of the part ensues, preventing the proliferation of cancer-cells. It is also declared that the percentage of recurrences is less than with operation alone.

4. Diathermy (Nagelschmidt) is produced by the bipolar d'Arsonval current. It may be used for simple heating of the tissue or it may be carried to the point of destruction, in which case the tissues are cooked. No sparks are used by this method, but two electrodes are brought into direct contact with the tissue, the position of the indifferent electrode depending on the direction in which the heating or destruction is desired. The current flows in both directions, and meeting with resistance in the body, completing the circuit, heat is generated in the tissues.

5. Fulguration is produced by the high-frequency current. The term "fulguration" is derived from the Latin word "fulgur," meaning lightning or spark.

an induction coil and desiccation from a high potential static apparatus.

DIFFERENTIATION BETWEEN THE PHYSICS OF DESTRUCTIVE FULGURATION AND DESICCATION

While the current generated from a coil or other magnetic device, and transformed by proper accessories, is capable of producing a coarse destructive action, the current from such a source has insufficient frequencies or oscillations, and is incapable of producing the refined desiccation effect, on account of the interruptions in the primary of the coil. As no discharge can be transmitted to the body until such interruption occurs, the current is delivered in a series of hot discharges, which renders the thermic degree inconstant, and the impact against the tissue painfully severe. A steady flow of current as is produced from the static machine is necessary, but it must be of large capacity and subject to control, or it will fall short of or go beyond the desiccation point. The destructive effect on tissue produced by the coil type of current may be compared to a surgical operation with a saw-edged knife, while the devitalizing effect produced with the static type of current may be likened to the more refined action of a keen-edged bistoury.

EFFECTS OF DESICCATION

The size and depth of the area that may be desiccated with one application is controlled by the operator and depends on the following six factors: (1) current strength; (2) whether monopolar or bipolar; (3) frequency of oscillations; (4) distance of the electrode from the body; (5) time of exposure, and (6) density of tissue.

Desiccation is usually, but not always, contra-indicated in neoplasms that are covered by healthy skin, as the skin must also be destroyed to reach the diseased tissue. Desiccation destroys tissue without opening blood- or lymph-channels, and will act as a styptic when there is oozing of blood. It sterilizes tissues on which it acts directly, as has been shown by experimentation with cultures taken before and after treatment of an infected area of tissue. A dry crust forms at once after the application, and the time required for separation depends on the character of the tissue. In the case of mucous membranes the desiccated tissue soon becomes macerated by the secretions and may separate in a few hours, while on the skin surface it takes a longer time. When the skin is soft and vascular there is more rapid separation than when it is hard and with poor blood-supply. Thus, a soft mole will slough more readily than a callus. Regeneration of skin or scar tissue often takes place underneath the crust. The procedure is not entirely painless, but quite bearable if the technic is correct. The current, applied gently at first, has anesthetizing properties. It is usually sufficient, but in supersensitive persons a local anesthetic is employed in addition, either by topical application in the case of mucous membranes and ulcerated surfaces, or by infiltration if the area is extensive and deep, although the latter is never practiced when there is a suspicion of malignancy; cocaine is driven into the tissue by positive galvanism is used in preference. In rare cases a general anesthetic is employed. Nitrous oxid gas and oxygen is used in preference, although chloroform may sometimes be employed. Ether should never be considered on account of its inflammable properties.

CONDITIONS FOR WHICH DESICCATION IS
APPLICABLE

Verruca, Moles, Roentgen-Ray and Senile Keratosis.—Usually one application is sufficient in these conditions. The lesion is immediately transformed into a dry crust. It was my practice formerly to allow this crust to remain until it separated naturally, but it has recently been found that it is an advantage for immediate cosmetic reasons and more rapid healing to remove the crust at once with a groove director, or some such instrument. The base of the lesion is then sealed by superficial desiccation, and the thin ensuing crust separates in a few days. Healing is rapid, and the area, which is at first slightly red, gradually fades to normal color. There is no contracture as is usually the case with cauterization, but a smooth surface results. It is justifiable to advise the removal of these growths for other than cosmetic reasons, as they may be considered precancerous lesions.

Nevus Pigmentosus and Vascularis, Lentigo, Chloasma, Tattoo Marks, Coal Marks, Etc.—In these conditions the technic is the same as in the preceding, and the results have been quite satisfactory. In large port-wine marks and pigmented nevi I have found the ultraviolet ray produced by the Kromayer quartz-mercury lamp more satisfactory.

Keloid.—Desiccation followed by the Roentgen rays has been found to be a successful treatment. The same results may be obtained by the Roentgen rays alone, but a longer time is required. It has been observed that a better cosmetic result is obtained by desiccation followed by the Roentgen rays than by excision and the Roentgen rays.

Neoplasms of the Hollow Viscera.—Bladder: Employing a catheterizing cystoscope under the usual aseptic conditions, the urethra is anesthetized by a 2 per cent. cocain solution, or some other local anesthetic, and the bladder distended with sterile water or boric acid solution. A wire insulated to the end is then passed through the instrument and brought in direct contact with the growth, which may be destroyed in one, or a series of applications, depending on its size. The current and destructive action is always under the control of the operator. Recent experience justifies the hope that in selected cases desiccation may be of service in prostatic hypertrophy, treated by the urethral route.

Urethra: Papilloma, Caruncle, Granulations, Infected Glands, etc.: A thin insulated wire is passed through the treatment aperture of an air-inflation or other urethroscope, as is done with the applicator in making topical applications. Papilloma, caruncle, chronic granulations and infected glands following Neisserian infection, or other causes, may be destroyed, and there is sterilization somewhat deeper than the area destroyed because of heat penetration. The advantages of this treatment over the cautery and chemical escharotics are absence of much inflammatory reaction and no contracted cicatrix, and hence less likelihood of stricture.

Rectum: Hemorrhoids, Papilloma, Granulations, Ulcerations, etc.: External hemorrhoids and growths near the rectum may be very satisfactorily treated by desiccation, and growths in the rectum when a suitable proctoscope is used to render the lesion accessible. Operation is usually to be recommended in extreme internal hemorrhoids in preference to desiccation, but should there be a contra-indication to operation, even these may be successfully treated by desiccation.

Larynx: Tumors of the larynx may be destroyed by desiccation. The laryngoscope or the ordinary laryngeal mirror may be employed to expose the interior of the larynx, and the current applied by means of an insulated wire suitably curved. It is essential to success in these cases to destroy all reflexes in the throat with a strong solution of cocain; otherwise the application of the current will be impossible.

There is reason to hope that with improved endoscopes the future may show desiccation to be applicable to some neoplasms in the esophagus and stomach.

Throat and Pharynx: Neoplasms in these regions are quite accessible, and may be destroyed by desiccation. Mucous membrane growths respond readily. The whole or a portion of diseased tonsils may be desiccated without causing bleeding, and the operation is made bearable by applying a solution of cocain of sufficient strength. Desiccation has no particular advantage over excision in tonsil work, but should there be a refusal or contra-indication to operation, then desiccation may be relied on as a worthy substitute. In young children operative measures are to be recommended in preference to desiccation in throat conditions, because a general anesthetic must be used. Chloroform in the presence of unusual heat gives off hydrochloric acid and chlorin fumes, and ether is contra-indicated on account of its inflammability.

Nose.—Growths in the anterior nares, such as polyps, angiomas, papillomas and epitheliomas are accessible, and are usually successfully treated by desiccation.

Eye.—Desiccation may be applied externally to the lids for such lesions as xanthoma, verruca, nevi and epithelioma, and to the conjunctiva for trachoma, dry granular conjunctivitis, papilloma, ulcerations and pterygium. There is little danger in working near the eye, as the control of the desiccation current is perfect.

APPLICATION OF DESICCATION IN MALIGNANT
DISEASE

1. *Cutaneous Surfaces.*—(a) *Localized:* Desiccation in my hands has been almost uniformly successful in localized epitheliomas and rodent ulcers of the skin. The destruction is carried beyond the diseased area for a short distance to insure thorough eradication. Blood- and lymph-channels are sealed, on account of which there is less likelihood of metastasis. Healing is rapid, and the cosmetic effect excellent. When a large area is involved a short course of Roentgen-ray treatments following desiccation is advisable, taking advantage of their well-known selective action on cancer-cells, lest there be some disease that possibly escaped desiccation. This may not always be necessary, but it is wise to take advantage of this combination treatment. As much can be immediately accomplished by one desiccation application as can be accomplished by the Roentgen rays alone in a comparatively long period of time, and desiccation will cure cases that the Roentgen rays alone will not affect, but in combination the efficiency of both is increased.

(b) *With Metastasis:* The results in these cases are usually unsatisfactory by any method, and no claims are made for desiccation except in conjunction with radical operative measures, when the field may be desiccated after operation in suitable cases, to seal blood- and lymph-channels. It is a duty as a routine measure to treat postoperatively with the Roentgen

rays as the best means of preventing recurrence, promoting comfort to the patient and prolonging life.

2. *Mucous Membranes.*—(a) *Localized:* In localized cancer of the mucous membranes, such as the tongue, and the buccal surfaces or the lip, the results of desiccation compare favorably with those obtained in localized skin cancers, although there is not quite the same assurance of success, on account of greater proneness to metastasis and because one cannot be sure that the adjacent glands are not involved, even though they may not be palpable.

(b) *With Metastasis:* This is the most hopeless class of cases with which the surgeon has to deal, and there is much to be desired with any treatment known at the present time. Desiccation is used only as a palliative. Unless too far advanced, the chance of possible success afforded by radical operation or desiccation followed by the Roentgen ray should not be denied the patient.

3. *Inoperable Cancer.*—In absolutely inoperable cases, whether of the skin or mucous membranes, the initial lesion may be desiccated and massive Roentgen-ray dosage applied to the glands and desiccated site. Some unexpected good results have shown that this course is sometimes justified. In cancer of the cervix and rectum, if inoperable, desiccation as a palliative means has advantages over the curet and cautery, for the reasons that a general anesthetic is unnecessary, there is less inflammatory reaction, it destroys the accessible diseased tissue quite as effectively, sterilizes, deodorizes and will stop bleeding.

4. *Postoperative Recurrences.*—Desiccation has a field of usefulness in postoperative recurrences in any location that is accessible. For example, recurrence along the line of excision in cancer of the breast may sometimes be controlled by this method, or at least act as an excellent palliative.

5. *Sarcoma.*—In accessible sarcomas, if seen early, desiccation is a satisfactory treatment. One extensive melanotic sarcoma of the forearm, confirmed by pathologic examination, which was excised, recurred in a short time and was desiccated. There has been no recurrence at the points treated for two years, but several new foci appeared at various times, which were all controlled by desiccation. In advanced sarcoma the same general rules apply as in advanced carcinoma.

Miscellaneous conditions in which desiccation has been used with success are: early Paget's disease, lupus vulgaris and erythematosus, acne vulgaris, hypertrophic acne rosacea, adenoma sebaceum, chancroids, condylomas, clavus, varicose and other ulcers with exuberant granulations, growths and granulations on the tympanum.

SUMMARY OF INDICATIONS

1. Desiccation is a successful treatment for all accessible benign neoplasms or lesions of the skin and mucous membranes in which destruction of tissues and good cosmetic result is desired. All of such lesions may be regarded as possibly precancerous.

2. Desiccation is curative in the great majority of localized malignant lesions of the skin and mucous membranes. In the more advanced cases the efficiency is increased by combining it with the Roentgen rays, attention being paid to accurately measured dosage.

3. Desiccation is only palliative in cancerous lesions associated with glandular metastasis, in postoperative

recurrences and in cases too far advanced for operation. The use of desiccation and the Roentgen rays in some of these cases is justifiable, because sometimes good results beyond expectations are obtained.

I have endeavored to present the important features of this method, covering the various fields of application as briefly as possible, and it is hoped that the presentation is sufficiently comprehensive to serve as a basis for others who may desire to take up the work.

1809 Chestnut Street.

ABSTRACT OF DISCUSSION

DR. JAY F. SCHAMBERG, Philadelphia: Desiccation is a valuable method in appropriate cases of various cutaneous growths. Many of these conditions, as we know, are quite amenable to other methods of treatment long employed by dermatologists. For example, angiomas, in most cases, can be satisfactorily removed by carbon dioxid snow. I believe the method described by Dr. Clark, however, is very valuable in cancer of the mucous membranes of the nose and mouth, particularly the latter, which often proves unsatisfactory to other methods, including surgical procedures. From what I have seen in Philadelphia of the results of the desiccation and fulguration method, I believe it is perhaps the best one I know of in the treatment of cancer of the mouth, and is preferable in many cases to excision. It has a very excellent field of usefulness in the treatment of cutaneous growths, although there are many other physical agents that are equal and some, perhaps, superior to it for the removal of superficial lesions. In a few of the cases I have seen, fulguration has produced an unnecessarily extensive destruction of tissue, more so than would follow other well-chosen methods. These cases, however, had not been treated by Dr. Clark. It might be well for others to emulate Dr. Clark and perfect the technic of this method of treatment, which appears to have a distinct field of usefulness.

DR. H. H. HAZEN, Washington, D. C.: One disadvantage is that in these cases it is impossible to obtain a specimen for pathologic study, so that the true character of the lesion can be determined. We know that with the prickle-cell type of epithelioma, metastases are very apt to occur, while with the basal-cell type they are very rare, and we need statistics on the ultimate results in these cases, based on pathologic examination.

DR. C. A. SIMPSON, Washington, D. C.: How does Dr. Clark get his selective action by this fulguration method? Does he compare it with the selective action of the Roentgen ray or radium?

DR. W. H. SCHMIDT, Atlantic City: I have had some experience with this method, and have recently employed it in two cases of cancer of the throat. In the first case, in which the disease was well advanced, the pain was relieved after two or three applications of the desiccation method. In the second case, which is still under treatment, the outlook is favorable. The disease is not so far advanced as in the first case, and not only has the pain been relieved, but also the ulcerated surface has a much healthier appearance, and the discharge has lessened. I have also found the method of value in infected and painful ulcers of the leg.

DR. ARTHUR F. HOLDING, New York: Radium is expensive and difficult to obtain, and so far as I have been able to ascertain, the method of treatment described by Dr. Clark is applicable to the same class of cases as is radium, and inasmuch as many practitioners cannot obtain radium, while this apparatus and method of treatment, on the other hand, is within their reach, it is a very valuable addition to our armamentarium. Of course, radium may possess certain properties or advantages of which we are now ignorant, but so far as we know at present, its usefulness in skin diseases is now limited to a class of cases approximately similar to those reported by Dr. Clark. The apparatus necessary to apply desiccation is much more readily obtainable than radium, and up to the present it seems to have produced equally good results in the treatment of various skin growths, and in less time.

DR. WILLIAM L. CLARK; Philadelphia: Dr. Schamberg referred to the unnecessary destruction of tissue by the fulguration method in some of the cases that came to his notice. I wish to again emphasize the fact that fulguration and desiccation are separate and distinct methods. With desiccation, in experienced hands, there is no unnecessary destruction of tissue in any case, as the operator has complete control, even to the smallest discernible point. The reason sections for pathologic study were not taken in many cases is due to the fact that such a procedure, to a certain extent, would defeat the object of desiccation, which is to destroy tissue without opening blood- and lymph-channels. In apparently clear cases this risk is not taken; in doubtful cases sections have been taken and the channels immediately sealed by desiccation. Desiccation will destroy normal tissue quite as readily as malignant tissue if brought in direct contact, but the point made, an explanation of which was asked for, is that malignant tissue appeared to have been destroyed and had disappeared at points deeper than those actually primarily destroyed by desiccation. This is probably explained by the fact that abnormal tissue is of lower vitality than normal tissue, and that the heat penetration was sufficient to cause the death of the diseased cells, with recovery of the normal cells. In this way it does compare with the selective action of the Roentgen ray and radium. The desiccation method of treatment is applicable to other conditions besides skin lesions. It has been successfully used for neoplasms of such accessible mucous cavities as the larynx, bladder, vagina, rectum and urethra.

THE DIET IN TYPHOID FEVER*

LEWELLYS F. BARKER, M.D.

BALTIMORE

Whether fever patients shall be fed liberally or sparingly is an old question. Most of us were brought up on the adage, "Stuff a cold and starve a fever," though long before our time Graves¹ had advocated a liberal diet and had suggested that should his friends after his death seek a suitable epitaph for his grave they might use the words, "He fed fevers." In typhoid fever especially it was almost a universal practice to limit the diet to fluids and to a low caloric intake. Emaciation was believed to be inevitable in typhoid fever. Losses of weight as great as 30 or 41 per cent. (Curschmann²) have been recorded in extreme instances. Complications increased the loss of weight (Lorain³), but even on a diet of 2,600 calories per day in an ordinary case the weight may decrease by as much as 20 pounds (Purits⁴). The disinclination of the patient to take food was considered an indication that he did not need food. Further, it was supposed that food substances could not be well digested and assimilated in the course of high fever; and it was believed that the risks of hemorrhage and perforation were enormously increased in typhoid if solid foods were given. Finally, aside from the difficulties and dangers mentioned above, it was thought that in fever there is either (1) toxic destruction of protein which makes the maintenance of nitrogen equilibrium impossible even if the protein intake and the total caloric intake be as high or higher than is necessary to maintain weight and nitrogenous equilibrium in health (F.

Müller,⁵ Kraus), or (2) there is a simple hyperactivity of metabolic functions in typhoid which renders weight maintenance difficult (Benedict and Surányi,⁶ Ewing and Wolf,⁷ Grafe⁸).

Following Graves, a few clinical men attempted to nourish their typhoid fever patients better than before, but up to a few years ago, despite the advice of shrewd clinicians like F. C. Shattuck⁹ of Boston and A. G. Barrs¹⁰ of England, not many practitioners have dared to fly in the face of custom and resort to a high caloric intake. Recently, and largely through the influence of the enthusiastic studies carried on at the Bellevue Hospital, New York, by Dr. Warren Coleman¹¹ and his associates, clinicians have become more courageous, especially in hospital practice. A more liberal diet is now becoming general, though but few, perhaps, resort as yet to the high caloric values reached and advised by the more ardent advocates of liberal feeding.

METABOLISM IN TYPHOID

Laboratory workers have done and are doing their part to establish a rational basis for the feeding of fever patients. As early as 1882 von Hoesslin¹² had shown that foods were absorbed almost as well in typhoid fever as in health. A little later, a long series of publications appeared in St. Petersburg reporting the results of work in Chudnowsky's clinic. These Russian observers, according to Dubois,¹³ who gives a brief summary of their work, found that foodstuffs were very well absorbed in fevers, though the absorption was affected to a certain extent by the patient's general condition. Similar results were obtained by von Leyden and Klemperer.¹⁴ These earlier observers found that emaciation could be, to a large extent, prevented by liberal feeding in typhoid, though despite the administration of large quantities of protein they were unable to maintain nitrogen equilibrium in the disease.

In 1909 appeared the important article by Shaffer and Coleman¹⁵ on the protein metabolism in typhoid fever. Their investigations were undertaken with the idea that the destruction of body protein in fever might be reduced to normal limits by adding large quantities of carbohydrate to the food, to act as protein-sparers. Their research is a remarkable one and will doubtless be looked back to in future as an unusual example of a metabolic study of high order at a time when but relatively few such studies were being undertaken in this country. They concluded from their work that by the use of diets of high caloric value, especially rich in carbohydrates, it is possible to prevent not only the "febrile loss" of body protein-nitrogen in patients suffering from typhoid fever, but also

5. Müller, F.: Leyden's Handbuch der Ernährungstherapie, Ed. 2, i, 213.

6. Benedict, H., and Surányi, N.: Die Stoffwechselvorgänge während der Typhusconvalescenz, Ztschr. f. klin. Med., 1903, xlviii, 290; xlix, 482.

7. Ewing, J., and Wolf, C. G. L.: The Clinical Significance of the Urinary Nitrogen, iii, Nitrogenous Metabolism in Typhoid Fever, Arch. Int. Med., October, 1909, p. 330.

8. Grafe, E.: Zur Frage des Stoff- und Kraftwechsels im Fieber, Deutsch. Arch. f. klin. Med., 1911, cii, 213.

9. Shattuck, F. C.: Diet in Typhoid Fever, THE JOURNAL A. M. A., July 10, 1897, p. 51.

10. Barrs, A. G.: A Plea for a Less Restricted Diet in Typhoid Fever, Brit. Med. Jour., 1897, i, 125.

11. Coleman, Warren: The High-Calory Diet in Typhoid Fever: A Study of 111 Cases, Am. Jour. Med. Sc., 1911, new series, cxliii, 77; Five years' Experience with the High-Calory Diet in Typhoid Fever, THE JOURNAL A. M. A., Aug. 3, 1912, p. 363.

12. Von Hoesslin, H.: Arch. f. path. Anat., 1882, lxxxix, 95, 303.

13. Dubois, E. F.: The Absorption of Food in Typhoid Fever, Arch. Int. Med., September, 1912, p. 177.

14. Von Leyden, E., and Klemperer, G., in Handbuch der Ernährungstherapie (von Leyden), 1904, ii, 332.

15. Shaffer, P. A., and Coleman, W.: Protein Metabolism in Typhoid Fever, Arch. Int. Med., December, 1909, p. 537.

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Graves, R. J.: Clinical Lectures on the Practice of Medicine, Reprinted from Ed. 2, London, New Sydenham Soc., 1884, i, 136.

2. Curschmann, H.: Typhoid Fever, American edition, 1905, p. 368.

3. Lorain, P. J.: De la température du corps humain et de ses variations dans les diverses maladies, Paris, 1877.

4. Purits, K. N.: On Increased Feeding of Typhoid Patients, Arch. f. path. Anat., 1893, cxxxi, 327.

that due to the so-called toxic destruction of body protein. They are inclined to believe that there is a greater need for carbohydrate in fever than in health and that if the carbohydrate of the food intake be insufficient the body-protein will be drawn on to supply energy in an available form; if, on the contrary, enough carbohydrate be fed, the body protein will be protected. An interesting feature of the work of Shaffer and Coleman is the finding that from 10 to 15 gm. of nitrogen in the food ingested is sufficient to maintain nitrogen equilibrium, provided large amounts of carbohydrate be simultaneously eaten. They found that their patients could be induced to take as much as from 1,000 to 3,000 calories in the worst stages of the disease, while in convalescence an intake of from 5,000 to 8,000 calories could sometimes be reached. Later, E. F. Du Bois, working in Lusk's laboratory, studied especially the absorption of food in typhoid fever and, confirming von Hoesslin, found that typhoid patients can, throughout the disease, absorb carbohydrates and protein as well as normal persons. He asserted, too, that they can absorb very large amounts of fat, but that the percentage of absorption is somewhat lower than the normal, especially in the earlier part of the disease. During the present year, R. A. Kocher,¹⁶ working in Friedrich von Müller's clinic in Munich, has published a paper on the metabolism in fever and compared the results with those obtained on himself and on his companion (Ferguson) when engaged in active exercise. This investigator used the nitrogen minimum (Sivén), to which excretion in the urine can be reduced, as the basis of his studies. With a very low protein intake and a high carbohydrate intake, the amount of nitrogen excreted in the urine can be reduced to as little as one-third of the amount given out on total fasting. The nitrogen minimum is a high value in fever even with a caloric intake of 80 calories per kilogram. This increase in "nitrogen minimum" is due neither to increased expenditure of energy nor as Graham and Poulton have shown to the fever alone, nor to insufficient caloric intake. Kocher points out that an analysis of Shaffer and Coleman's experiments indicates that while nitrogen loss can be compensated for by a high caloric intake, there are periods in the disease when nitrogen equilibrium cannot be maintained. Kocher's findings, therefore, support the view previously expressed by von Müller that there is in fever an actual destruction of protein due to certain special influences on the protoplasm and that it is difficult or impossible to maintain protein equilibrium at certain periods of febrile disease, even on a high caloric diet.

THE HIGH CALORIC DIET

This has been described so often that its details need not be repeated here. For those who wish quickly to inform themselves regarding its content and mode of application I would recommend the perusal of the chapter dealing with it in Friedenwald and Ruhräh's textbook,¹⁷ or, especially, of the original article by W. Coleman and of that of Crohn.¹⁸

Where good milk is not available, or in the cases in which milk is not well borne, a diet such as that recommended by G. C. Rodgers,¹⁹ of Elkins, W. Va., may

be tried. In parts of the South (Florida, Georgia, etc.), physicians have told me that they have difficulty in securing good milk and that they often have to be content with foods other than milk in the treatment of typhoid fever.

The amount of food necessary to meet the needs in typhoid fever is undoubtedly large. Though Grafe asserts that the total metabolism in a fasting typhoid patient never exceeds 2,798 calories, Coleman's studies prove that to obtain nitrogen equilibrium, from 4,000 to 5,500 calories per day are necessary, that is, from 60 to 80 calories per kilogram of body-weight. The optimal protein intake seems to lie between 62 and 94 gm. in the twenty-four hours, which corresponds to 10 or 15 gm. of nitrogen per day. The carbohydrate intake is most important; when not contra-indicated for some special reason, it should make up, Coleman thinks, a half of the calories given. Fat seems to be better borne in the amphibolous period and during convalescence than in the earlier stages of the disease.

Protein may be taken in sufficient amounts as eggs and milk. Schottmüller²⁰ and other German writers give as much as 100 gm. of scraped meat per day, but in American clinics meat is rarely given, as it seems often to excite digestive disturbances and to increase renal irritation. Meat soups are also avoided, though a little broth or consommé may be given to improve the appetite and to stimulate the secretion of the gastric juice. If soup be given, it is well to add eggs and cereal to it to increase the caloric value. Eggs may be taken raw, or beaten up with milk, or as soft-boiled or coddled eggs. From four to eight eggs may often be given in the twenty-four hours.

The carbohydrate may be given partly as milk, partly as bread or toast (with butter), and partly as lactose added to the milk, cereals and orange-albumin. Coarse cereals with cellulose residue are to be avoided. Dry toast or zwiebach buttered, if thoroughly chewed by the patient, may be used without harm. Boiled rice and mashed potatoes may be given as variety. Lactose is a very important article of the diet. It is easily soluble, is not very sweet, and can be given in large amounts without the appearance of sugar in the urine.

A liberal amount of fat in the diet will send the calories up, but not all patients bear fat well, especially early in the disease. Fat may be tried in the form of cream, of butter and of yolk of egg. Coleman has been able to give as much as 200 or 250 gm. of fat per day without causing digestive disturbances. The fat content of ordinary milk is of course considerable, and milk in amounts of from 1.5 to 2 liters per day can be given to most patients without difficulty. Some patients, however, are intolerant of milk even when modified by peptonization, or by mixing with lime-water or with sodium citrate. Some patients take fermented milks very well, but the objection to them lies in the reduction of the carbohydrate content by the fermentation.

Fruit juices, to which lactose has been added, may be given, as long as there is no diarrhea, but they should be discontinued should diarrhea develop. It must be remembered, however, that patients on the high-calory diet ordinarily have from two to four stools a day.

16. Kocher, R. A.: Ueber die Grösse des Eiweisszerfalls bei Fieber und bei Arbeitsleistung, *Deutsch. Arch. f. klin. Med.*, 1914, cxv, 82.

17. Friedenwald, J., and Ruhräh, J.: *Diet in Health and Disease*, Ed. 4, Philadelphia, W. B. Saunders Company, 1913, p. 377.

18. Crohn, B. B.: Experiences with the Coleman-Shaffer Diet in Typhoid Fever, *THE JOURNAL A. M. A.*, Jan. 27, 1912, p. 259.

19. Rodgers, G. C.: General Diet in Typhoid Fever, Report of Two Hundred Cases, *Virginia Med. Semimonth.*, 1912-1913, xvii, 61.

20. Schottmüller, H.: *Die typhösen Erkrankungen in Mehr und Staehelin: Handbuch der inneren Medizin*, 1911, i, 504.

INDIVIDUALIZATION

Now that the pendulum has swung toward a high-calory diet in typhoid, the necessity of individualization should not be lost sight of. McCrae has pointed out the dangers of overfeeding in certain cases. I am convinced that there are some patients who cannot bear the high-calory diet; indeed, in our experience at the Johns Hopkins Hospital the resident physician, Dr. Clough, has found it difficult, in the early stages of the disease, to give as large amounts as seem easily possible in the New York Clinic, and we have had some patients to whom a large number of calories could not, we have thought, be administered wisely before the beginning of convalescence. Here good clinical judgment is essential. It is often very difficult, it is true, to say whether in a given case a digestive disturbance or a tympanites is due to some article of the diet or to a high grade of intoxication. I have obtained the impression myself that the severer forms of tympanites depend less on the food intake than on toxic paresis of the wall of the intestine due to a virulent infection or a low grade of resistance. Should tympanites or other digestive disturbances begin to appear, however, it is well to modify the diet at once and especially to restrict the intake of milk and of lactose. If, on the high-calory diet, examination of the stools shows that undigested food is passing through, the diet should be reduced.

A point emphasized by Coleman, the necessity of beginning cautiously and gradually increasing the caloric value of the intake, should be kept in mind. The plan Coleman recommends is to give a pure milk diet for two days in all cases. If the patient be very ill, he may be kept, thereafter, on a fluid diet of from 1,000 calories (1 liter milk, 50 c.c. cream, 50 gm. lactose divided into eight feedings), up to 3,900 calories (1.5 liters milk, 0.5 liter cream, and a pound of lactose, divided also into eight doses) in the twenty-four hours. Soft-boiled or scrambled eggs may be added to this diet even when patients are quite sick. In mild cases, the patients may from the beginning take, in addition, buttered toast, mashed potatoes and cereals in amounts sufficient to make the total caloric intake 4,000 per day. In convalescence 5,000 or 6,000 calories per day may often be given.

The contributions of trained dietitians to the technic of administering a high-calory diet are very welcome. The attractive dishes devised by Miss Edna Cutler,²¹ formerly of Bellevue, make a good start in this direction, and it is to be hoped that the dietitians in various hospitals will gradually supply us with a whole series of appetizing dishes which may be given without harm to our typhoid patients. In this connection I have found the cook-book of Jürgensen²² a valuable aid. I wish it could be translated into English, as the caloric content of each recipe is given. In calculating the caloric content of ordinary foods the little book by Locke²³ on "Food Values" is most helpful.

CLINICAL RESULTS

The careful analysis of the patients in Bellevue Hospital showed a lower mortality among the patients fed on the high-calory diet than among the other cases. Complications (hemorrhage; perforation) and relapses

were no more frequent than in patients fed in the old way. The great gain from the liberal diet consists in the lessening of emaciation, the shortening of convalescence and the prevention of exhaustion phenomena after the disease has run its course. Most patients lose 5 or 10 pounds even on the high-calory diet, though now and then a patient can maintain his weight. In the Johns Hopkins Hospital we have been struck with the better appearance of our patients during convalescence since we have fed our patients more liberally. Since convalescence can be shortened and emaciation prevented, there is good reason to believe that post-typhoidal psychoses and post-typhoidal neurasthenic states will be less common than under the old regimen. It is a little too early yet to speak positively regarding this point, but my clinical impression thus far favors the view stated.

In order that the high-calory diet may be successfully given, the details of the nursing must be carefully worked out. The times of feeding during the day and night, the relations of the food intake to the water intake, the quantities given each time, the variety of the food given, the estimation and recording of the calories in a special chart, the regular weighing of the patient, the encouragement of the patient, the tact and judgment of the nurse, are all points to be considered.

The high-calory diet in typhoid will be objected to by many patients, by many nurses, and by many physicians. It is no wonder that prejudice against it should be deep-seated, if we recall the past history of the dietetic treatment of typhoid fever. This prejudice is contributed to by false ideas regarding the character of the intestinal contents in typhoid and their relation to the ulcers. It is contributed to by an old fallacy—the argument *post hoc, ergo propter hoc*—which ascribed hemorrhage, perforation and relapse in typhoid to dietetic errors because they sometimes followed them. There are physicians in practice to-day who still believe it almost criminal to permit a typhoid patient to eat a piece of dry toast even when it is thoroughly masticated. Perforation will occasionally occur, it is true, after a patient has eaten dry toast, but this observation is far from establishing a causal relation between the two events.

As Dr. Edsall is to deal especially in this symposium with the dietetic limitations in certain cases of typhoid fever, I shall leave this side of the subject to him to present.

In conclusion, then, the evidence is at present in favor of the liberal feeding of typhoid patients, provided always that the diet be adapted to the needs and powers of the particular patient under treatment with avoidance of anything like a rigid routine applied to all cases indiscriminately.

Johns Hopkins Hospital.

Child Psychology and Education.—Normal children are neurologically incapable of following the logical sequence of ideas as generated by the adult. Their thought is unstable and incomplete because the association fibers in the brain are only in the process of development, are only as yet parts of an unfinished machine. A knowledge of this physical fact throws a light upon the state of mind which perpetrates the schoolboy "howler." "The weight of the earth is reckoned by comparing a mass of known lead with a mass of unknown lead," may produce a smile from the "man in the street," but the student of child life sees evidence of mental strain, confusion of ideas and only a partial absorption of an education which deals with *words* instead of *things*.—John Arrowsmith, *Jour. State Med.*

21. Cutler, Edna, Cited by Coleman, Note 11.

22. Jürgensen, C.: *Kochlehrbuch und praktischer Kochbuch*, Berlin, J. Springer, 1910.

23. Locke, E. A.: *Food Values: Practical Tables for Use in Private and Public Institutions*, New York, D. Appleton & Co., 1912.

THE EFFECTS OF FOOD ON METABOLISM
IN TYPHOID FEVER*

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After it had been ascertained that a patient could be carried through an attack of typhoid fever with the loss of but little if any weight and that the large amount of food required for this purpose is absorbed nearly as completely as in health, the next step in the investigation of the diet problem in this disease was obviously to determine the extent to which the food was utilized after its absorption and the effect it had on the general metabolism.

The investigation which forms the basis of this paper was undertaken in association with Dr. Eugene F. Du Bois.¹

There are two methods by which such an investigation may be carried out: direct or indirect calorimetry. Direct calorimetry implies the actual measurement of the heat produced by the body and requires an elaborate and costly apparatus. In indirect calorimetry the heat production may be calculated from the oxygen consumption and the carbon dioxid output, making allowance for that portion of the respiratory exchange which is due to protein metabolism.

Several types of apparatus have been devised for measuring the amount of oxygen absorbed and the amount of carbon dioxid given off during predetermined periods of observation. The apparatus which we employed and which we believe to be the most accurate is the Benedict "universal" or "unit" apparatus. A brief description of it will facilitate the discussion of the results which were obtained. The diagram is schematic. The machine consists of a closed circuit of tubes in which are interpolated a blower (*E*) to maintain an efficient circulation of air, two Williams' sulphuric acid bottles (*A* and *B*) to absorb the water-vapor of the breath, a bottle of soda lime (*S*) which takes up the carbon dioxid, a third bottle of sulphuric acid (*C*) which absorbs the water driven over from the moist soda lime, and a water-bottle (*F*) to moisten the air before its return to the respiratory passages. Fresh oxygen is admitted at *O*₂. Expansion of the circuit is provided for by means of a rubber bag (*D*) or a spirometer which rises and falls with expiration and inspiration respectively. The patient is connected with the apparatus by means of rubber tubes (1 and 2) which are inserted into his nostrils and made air-tight. The patient's mouth is sealed with adhesive plaster to prevent his opening it through inadvertence or through falling asleep.

When a patient is connected with the machine it is obvious that the only substances he can add to the air in the circuit are carbon dioxid and water; the only thing he can take from it is oxygen. The loss of weight by the oxygen-container and the gain in weight by the soda lime bottle (plus sulphuric acid bottle *C*) correspond to the amounts of oxygen absorbed and carbon dioxid given off during the period of observation. It may be added that the observations were made in periods of fifteen minutes each.

Kraus² was among the first to study the total metabolism in typhoid fever. He found that the metabolic processes do not depart essentially from the normal, and that the respiratory quotient in the postabsorptive (*nüchtern*, fasting) state corresponds to the nutritive condition of the body at the time of the observation, that is, to the completeness with which the storehouses have been filled. Following Kraus came a number of investigators (Regnard, Riethus, Rolly and Meltzer and others³) who, though working with different types of apparatus, obtained respiratory quotients which were so low that it was necessary to assume the occurrence of abnormal processes of metabolism in fever to explain them. This lack of confirmation cast doubt for a time on Kraus' conclusions, but the work of the last few years (Grafe⁴, Rolly⁵) is in agreement with that of Kraus, and the conclusion appears to be inescapable that the abnormally low quotients were due to some undiscovered error of technic.

Our studies of the total metabolism in typhoid fever were begun in the fall of 1911 and have been continued through each succeeding typhoid season.⁶

Since the investigation was undertaken primarily to determine whether the high-calory diet exerted any deleterious influence on the patient and whether and in what manner the food was utilized after its absorption, practically all of the observations were made shortly after a meal, on patients who had been receiving large amounts of food. This fact should be borne in mind in comparing the results with those of previous investigators whose patients had been without food for from six to fourteen hours.

HEAT PRODUCTION

The total metabolism, or heat production, was calculated from the oxygen consumption and the respiratory quotient, since the caloric value of the oxygen varies with the height of the quotient. Heat production is expressed in terms of calories per kilogram per day or per square meter of body surface per hour or day. The latter method is the more accurate but is less practical for routine clinical work.

Febrile Period:—The heat production of the high-calory cases (fifty-five observations), averaged for the entire febrile period, was 35.9 calories per kilogram per day.

The heat production in the postabsorptive state (fifty-one observations by other investigators), likewise averaged for the entire febrile period, was 35.3 calories per kilogram per day.

In both groups of cases there is an increase in heat production (35.4 per cent. and 33.2 per cent. respectively) above the average (26.5 calories per kilogram per day) of seventeen normal persons for the most part collected from the literature to serve as controls. But the increase in the high-calory cases over those in the postabsorptive state is only 1.7 per cent, and lies within the limits of error.

It is evident, therefore, that even large amounts of food (at least, when the protein is kept relatively low) do not increase the heat production, or the fever, in the febrile stage of typhoid.

In health the taking of food is followed by an increase in heat production which, according to

2. Kraus: *Ztschr. f. klin. Med.*, 1890, xvi, 160.

3. For these and other references, see Grafe (*Deutsch. Arch. f. klin. Med.*, 1909, xciv, 544).

4. Grafe: *Deutsch. Arch. f. klin. Med.*, 1910, ci, 209.

5. Rolly: *Deutsch. Arch. f. klin. Med.*, 1911, ciii, 93.

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

¹ From the Department of Applied Pharmacology, Cornell University Medical College and the Second Division of Bellevue Hospital.

1. The detailed results of the investigation will appear shortly in the *Archives of Internal Medicine*.

6. During the season of 1913-14 the calorimeter, constructed in the Second Medical Division of Bellevue Hospital under the auspices of the Russell Sage Institute of Pathology, was employed. The results obtained with its aid will form a separate communication.

Rubner, is due to its specific dynamic action, and it has simply been assumed that food exerts such action in fever. Many years ago von Hoesslin estimated the supposed increase in metabolism at 10 per cent. to 15 per cent. and later writers accepted his estimate.

The reason food does not exhibit its specific dynamic action in typhoid fever can, at the present time, only be conjectured. It is not without analogy, however, for in health the specific dynamic action of food does not appear when metabolism is stimulated by external cold.

Convalescence.—The heat production of the high-calory cases was essentially uniform in the first four weeks of convalescence. The average of forty-nine observations covering these weeks was 36.2 calories per kilogram per day. This is 36.6 per cent. above normal and slightly less than 1 per cent. above the heat production in the febrile period.

The reason for the persistence of such a high metabolism into convalescence has not been definitely ascertained. Since the temperature remains normal and the patients show steady improvement in weight and strength and appearance, however, there is no present reason to consider that the high metabolism contra-indicates the liberal use of food.

In the postabsorptive state, in the case of patients who have received insufficient food during the fever, the metabolism increases with each week of convalescence, at least up to the fourth, as is shown in the following averages: In the first week the average of 25 observations was 26.9 calories per kilogram per day; in the second week, the average of 18 observations was 28.3 calories; in the third week the average of 15 observations was 29.7 calories; in the fourth week the average of 24 observations was 30.6 calories.

Since, under the older methods of dieting, the total food is gradually increased as convalescence progresses, the increasing metabolism may be considered to represent the specific dynamic action of the food.

THE RESPIRATORY QUOTIENT

The relation of the carbon dioxide output to the oxygen consumption constitutes the respiratory quotient, $\frac{\text{CO}_2}{\text{O}_2}$, which, together with the nitrogen of the urine, furnishes information respecting the nature and amounts of the substances which the body is consuming.

The chemical composition of carbohydrate is such that when it is completely oxidized to carbon dioxide and water, either within or outside of the body, the volume of carbon dioxide produced and of oxygen consumed are exactly equal; consequently, the quotient is 1.0. When fat alone is completely oxidized to carbon dioxide and water, the quotient is 0.7. When protein alone is oxidized to urea, the form in which the greater portion of it leaves the body, the quotient is 0.8.

But the body in its metabolic activities always utilizes more than a single foodstuff and the value of the respiratory quotient varies according to the proportions of protein, fat and carbohydrate consumed; the greater the proportion of carbohydrate, the higher the quotient. Quotients over 1.0 are obtained during the transformation of carbohydrate, an oxygen-rich body, to fat, which is oxygen-poor. According to current belief, the respiratory quotient never falls below 0.72 in fever.

Febrile Period.—In the febrile period the average respiratory quotients of the high-calory cases rose

steadily from 0.83 in the earlier stages to 0.88 in the later. The average quotient for the whole period was 0.86.

The average respiratory quotients of the postabsorptive cases exhibited a tendency to fall. Though the fall is slight it suggests the gradual depletion of the glycogen reservoirs in consequence of the insufficient food-supply. The average quotient for the whole febrile period was 0.767.

This difference of nearly 10 points in the average respiratory quotients of patients after food and in the postabsorptive state is very significant. Since the height of the quotient corresponds to the relative proportion of carbohydrate consumed, the higher quotient of the high-calory cases clearly indicates that the body utilizes carbohydrate when it is available in preference

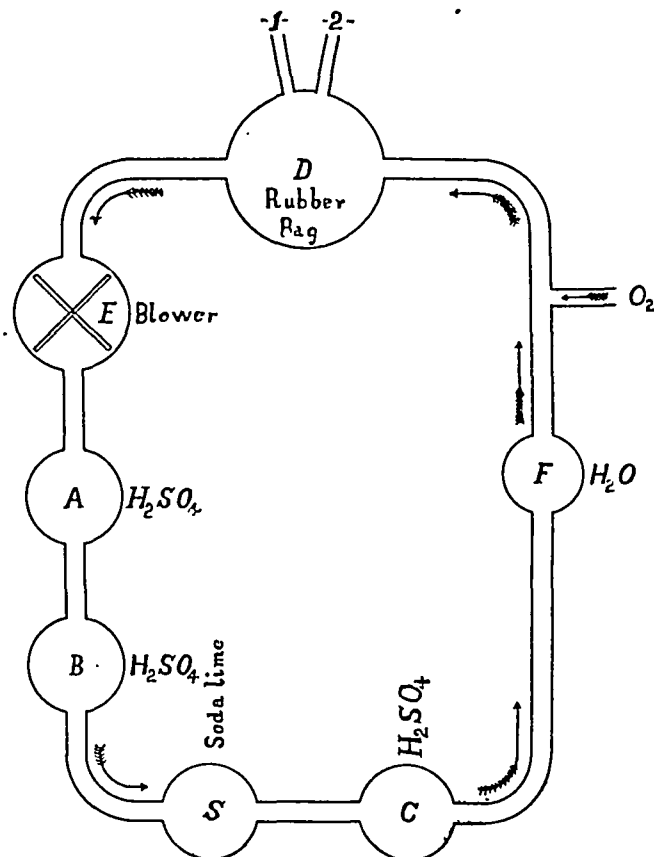


Diagram of the Benedict "universal" or "unit" apparatus for measuring absorption of oxygen and output of carbon dioxide.

to fat or protein for the increased production of energy in fever just as it does in health when called upon to perform extra work.

Convalescence.—In the first week of convalescence the average respiratory quotient after food was 0.93. In the second week the average had risen to 1.01, indicating that, in some cases, the formation of fat from carbohydrate was in progress. In the third and fourth weeks the quotient fell, the averages being 0.95 and 0.91 respectively.

In the postabsorptive cases the respiratory quotient rose steadily during the first four weeks of convalescence, the averages being 0.82, 0.84, 0.92 and 0.96. The rise corresponds to the increase in the food as convalescence progresses.

Though the formation of fat was observed in a few patients in the earlier weeks (in the first in two of Grafe's and one of Rolly's) the respiratory quotient

indicates that the food was still insufficient to meet the ordinary demands of the body for energy, and, at the same time, to permit the replenishment of the stores of fat and glycogen until the fourth week had been reached or even later.

GENERAL CONSIDERATIONS

We may apply the facts which this study has brought out, together with others previously ascertained, to the dietetic requirements of the typhoid patient in the following manner:

The increase in total metabolism which occurs in typhoid fever creates a demand for more food than would be necessary to maintain the same individual in equilibrium in health, if he were confined to bed. The average increase during the course of the fever reaches about 34 per cent., but, for reasons which are not yet apparent, an amount of food which is just sufficient to cover the heat production will not protect the body protein. It has been pointed out on other occasions that a much greater quantity of food is necessary for this purpose, and that the quantity varies with different patients. Rolland⁷ succeeded in establishing nitrogen equilibrium with 45.5 calories per kilogram per day, but Shaffer and Coleman⁸ were unable to accomplish it in any patient with less than 58 calories; in one patient 85 calories⁹ were required, and in others even this quantity of food did not suffice for the purpose.

It will scarcely be denied that a typhoid patient should receive in his food enough energy to cover his heat production. This amounts on the average to 35.9 calories per kilogram per day when the patient lies at complete rest, quietly breathing into the respiration apparatus. Under ordinary conditions, however, he moves about the bed more or less and thereby increases his metabolism at least 10 per cent. Therefore, on the basis of heat production alone, the food should furnish 39.5 calories per kilogram per day.

But since such an amount of food will not maintain the patient in nitrogen equilibrium, these questions present themselves: Shall the typhoid diet be arranged merely to cover the heat production, or shall the attempt be made, by giving more food, to protect the body protein? The results of this particular investigation do not furnish the answer; it must be drawn from other sources.

The production of energy is not the sole purpose of food. Food must maintain the body in a condition of equilibrium or illness, if not death, will follow.

While it is true that countless numbers of typhoid patients have survived the loss of large amounts of body protein, drawn, for the most part, from their muscles, may it not be equally true that many have died because the loss was not prevented? A normal man who is losing protein nitrogen is not receiving sufficient food. Such persons are notoriously less able than those in perfect health to resist invasion by pathogenic bacteria, or successfully to combat disease. A typhoid patient who is losing nitrogen is consuming his own tissues to supply the deficit in his food. And since it has been found possible to prevent this drain I am firmly of the opinion that the patient's best interests are conserved by giving sufficient food for the purpose, providing in all instances that the digestive

organs are capable of handling it. The patients who have come under my observation have been in better condition, the more nearly nitrogen equilibrium has been approached, and they have lost weight until this condition has been reached.

In this connection it may be recalled that a normal man cannot be maintained in nitrogen equilibrium if he receives only sufficient food to cover his basal heat production. This is due to the specific dynamic action of the food, or, as Lusk has shown, to the stimulation of metabolism by the excess of metabolites in the circulation. The reason that a typhoid patient cannot be maintained in nitrogen equilibrium on an amount of food which just covers his heat production has not yet been discovered.

The high quotients of the high-calory cases during the course of the fever have a practical relation to the selection of foods for the typhoid patient. As already pointed out, the height of the quotient is proportional to the amount of carbohydrate which is consumed. In our observations the quotient invariably rose after a meal containing carbohydrate. In one patient, a boy of 17 years, it rose on the fourth day of a relapse to 1.04 while the temperature was 102 F. The explanation of this is that the glycogen stores had been replenished during the preceding afebrile period, the food which the boy had received before breathing into the machine contained more carbohydrate than he needed for his energy exchanges, and a portion of it was transformed into fat.

This observation possesses very great interest in that it illustrates that the constructive processes of metabolism may be called into play even in the presence of fever. No reason is apparent why, if sufficient carbohydrate is supplied during the original fever, the same transformation might not occur. When a patient comes under treatment early in the disease the desirability of attempting to add to his store of fat may well be questioned. When, however, a patient has lost much weight I believe that the attempt should be made to bring the constructive processes into action even though fever is present.

The foregoing discussion should not be construed as the expression of an opinion prejudicial to the value of fat. The rôle of fat in the fever diet has not yet been completely learned. Observations designed to test its value are already under way and others have been planned. At present I am in position to say only, on the basis of clinical experience, that I believe fat to be an important constituent of the diet. In the case of patients who cannot take much carbohydrate it serves to keep up the energy value of the food and, so far as clinical observation tells, to maintain the patients' nutrition. In other patients it appears to be a physiologically economical way of increasing the total food intake.

These opinions derive support from the fact that the more intimately the processes of metabolism in fever are understood, the more nearly are they seen to approach normal. With the exception of the unexplained need of the typhoid patient for an excess of food over his heat production in order to maintain nitrogen equilibrium, the only difference, which may be considered to have been clearly established between the metabolic processes in fever and in health, is a difference in intensity.

CONCLUSIONS

1. Food does not increase the heat production or the temperature in typhoid fever, even when given in

7. Rolland: *Deutsch. Arch. f. klin. Med.*, 1912, cvii, 440.

8. Shaffer, P. A., and Coleman, W.: *Protein Metabolism in Typhoid Fever*, *Arch. Int. Med.*, December, 1909, p. 538.

9. In some of these cases the carbohydrate calories alone, in the food, reached 50 and more a day.

large amounts (at least, when the quantity of protein is kept relatively low). Therefore, the fear which has been entertained by physicians for so many years that a liberal diet would raise the temperature of the patient is proved to be groundless.

2. The body utilizes carbohydrate in preference to fat or protein to meet the increased demand for energy in typhoid fever just as it does in health when called on to perform additional work. Consequently, carbohydrate should occupy a prominent place in the diet.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. BARKER AND COLEMAN

DR. LAWRENCE LITCHFIELD, Pittsburgh: I do not think enough stress has been laid on the way in which the high-calory feeding should be instituted, the time it should be commenced, and its gradual development. In the early stages of the fever when the patient is first stricken, with coated tongue, anorexia, etc., food is distasteful and it is almost impossible to get patients to take it, but if their digestive apparatus is treated with respect during the first stage, it is not long before the patient will begin to have an appetite and a cleaner tongue. Then is the time to begin feeding, and the amount should be increased gradually with the patient's increasing ability to take care of it. Milk in typhoid fever is regarded as a liquid food, while in reality it is sometimes the most solid food we could give. There is nothing more resistant than the curds sometimes found in typhoid stools. Another danger of the milk in cities where it is usually pasteurized is that the lactic-acid bacillus is killed, but the more dangerous spores are not killed and the milk may become very toxic with the warning sourness. Some years ago we had in Pittsburgh the most beautiful place to study typhoid fever and just before taking up the more liberal feeding of typhoid patients, I had two hundred patients on fermented milk which I fortified by the addition of cream and sugar of milk, with excellent results. Milk that is fermented does not form the large curds in the stomach, and except in rare cases it is easily borne by the patient and readily taken. I gradually increased the liberality of my diet and in 1908 or 1909 was giving toast, scraped meat, eggs, etc. The patient should be given things on which he can chew. Mastication helps to keep the mouth and tongue clean and stimulates appetite and digestion. With patients who do not take food readily, when we are at a loss to introduce a sufficient number of calories, I have, in some cases, been pleased with the results of glucose solutions given by enteroclysis. In desperate cases I give dextrose in isotonic solutions intravenously, as much as 2 liters of a 5.1 per cent. solution in twenty-four hours. When constipation is troublesome the feeding of fruit and vegetables is often not advisable, and in such cases I have found paraffin oil very satisfactory. I once had 150 consecutive cases of typhoid fever on small daily doses of Epsom salt. There were no accidents and no unusual percentage of sequelae and the mortality was lower or a little less than my average. I think, however, paraffin oil is better than Epsom salt for troublesome constipation in typhoid fever. My last patient was a young married woman, six months pregnant, with paratyphoid infection complicated by an acute hepatitis and cholecystitis. She was very sick, but, after the first few days, took a liberal diet and made an uneventful recovery.

DR. O. T. OSBORNE, New Haven, Conn.: Tympanites, which I believe is not a symptom, but a complication, is most important. It means a disturbed digestion, with fermentation, and it interferes with breathing, with the action of the heart, and vastly increases the danger of hemorrhage and perforation. Hence, tympanites should be prevented, if possible, and the diet and care of the bowels is all-important. Inflammation in the intestines in typhoid fever is a surgical

process, and the cleaner the small intestine is, the better for the patient. I would not allow constipation or a diarrhea, except what may be termed a therapeutic diarrhea; namely, the bowels should be moved at the will or decision of the physician. I give calomel or castor-oil in the beginning of the disease, and every alternate day the bowels are moved by cascara, aloin, or a saline. On the intermediate day the nurse gives a rectal injection of 1 ounce each of glycerin and water. After the bowels have moved once thoroughly, or at most twice, I direct the nurse to give a tablet of morphin $\frac{1}{10}$ grain. This will stop excessive action of the bowels and check peristalsis. The patient should have all the nutriment necessary to carry on all of his metabolism: I give a cup of coffee in the morning, with a little sugar in it; two cups of oatmeal gruel a day; and two whole eggs a day, either raw or poached. Raw egg-albumin, or egg-white, is not a satisfactory nutriment. If the patient is well enough to chew, he should have dry or buttered toast. He should also have, daily, the juice expressed from a pound of chopped beef which has been first covered with cold water, allowed to stand an hour, and then the whole juice and water expressed out. This amount of nutritive liquid may be served salted at two or three feedings. The patient should also have a pint of milk a day, the juice of one orange, and two or three tablespoonfuls of lime-water. If the tongue is much coated, the patient should have a little dilute hydrochloric acid after milk, eggs, or meat. If it is best not to administer meats or meat-juices, the patient should receive a small dose of iron each day, and my choice is *Eisenzucker*. In spite of such care of the diet and the bowels, some tympanites develops, I use yeast or lactic-acid bacilli treatment.

DR. ALLAN C. EUSTIS, New Orleans: My experience was acquired in a large country practice after having had the disease itself. I had so much milk poured into me that I became nauseated at the sight of it, and about the tenth day I wanted carbohydrates in the form of toast and molasses, etc. In my practice in the country I began to feed my patients, more especially on carbohydrates, when Dr. Coleman's work came out. I have since been an ardent advocate of his principles. I think we make the mistake of paying too much attention to quantity and not enough to quality. I believe tympanites is not a symptom but a complication, and, further, that the dry, coated tongue is also a complication, and can be cleared up by the proper dietetic measures. In the last three years I have collected twelve cases in which we have kept the patient's tongue dry and clean, simply by a properly selected diet. Analyses of the gas passed by the rectum in several cases have shown carbon dioxide as rare, hydrogen sulphid and methane predominating. I do not believe, therefore, that carbohydrates cause tympanites, but consider protein putrefaction as responsible. A high indican test is an indication to take the patient off of protein and substitute carbohydrate in any easily digestible form, such as sugar, toast, mush, cream of asparagus, soup, gruels, etc. A patient should be given three meals a day and should be treated the same as a healthy person, allowing ample time at night for sleep. In this way you do not tire out the gastric juice, and the caloric content can be kept up by giving fruit juices with sugar of milk between meals. I have often allowed patients to take a cocktail before their meals if they have been used to it. Frequent examinations of the twenty-four-hour nitrogen output of these cases showed that they do well with 5 to 10 gm. of nitrogen per day. Intestinal poisons must always be considered when treating a typhoid patient, and I would recommend the daily examination of the urine for indican, which, when present, should be eliminated by a lowering in the protein of animal origin.

DR. LEWELLYS F. BARKER, Baltimore: The three striking changes, clinically, in the appearance of typhoid patients in hospitals are (1) the changes in the tongue; (2) the lessening of the tympanites, and (3) the prevention of extreme emaciation. We do not see the old "typhoid tongue" any more. We rarely see marked tympanites, with careful feeding; occasionally, however, we do see it. I hope some one will find out how always to prevent tympanites. Only last week, a close friend of mine died from typhoid with tympanites and per-

foration, temperature 106. If we could have prevented the tympanites in this case he might have lived, but I think he had toxic paralysis of the walls of the intestine. I think bacteriologic study throws some light on relapses. In the first week of the disease, there are always large numbers of typhoid bacilli in the blood; there are relatively few in the second and third week. There is a new bacillemia with every relapse. We clinicians feel that a great debt of gratitude is due to the men who carry out the careful metabolic studies on which improvements in therapy can be based. The final judgment has, however, to be made by the clinical men who apply these studies in the actual treatment of a large series of cases. The laboratory research must be followed and supplemented by clinical research—the testing by actual observations, at the bedside, of the applied findings.

DR. WARREN COLEMAN, New York: Few points remain to be considered. The first concerns the remark of Dr. Barker concerning the possible objections to the use of the high-calory diet. He suggested that some nurses complain of the amount of work which the diet entailed. Without exception, the nurses to whom I have spoken of the matter have agreed that the preparation of the food was less troublesome than the care of patients under the older methods of dieting. The high-calory patients are rarely delirious and they rarely suffer from diarrhea, whereas, formerly these symptoms were common and often demanded a nurse's whole attention. The objection to fermented milks is that their fuel value has been reduced by the removal of the milk-sugar. With a diet in which proteins predominate the putrefactive organisms dominate the flora of the intestine. In the presence of large amounts of carbohydrate the fermentative type predominates. This is an additional reason for keeping the protein low—from 10 to 15 gm. of nitrogen in twenty-four hours. I believe that in most cases tympanites is due to injudicious dieting. I never give laxatives or purgatives in typhoid. A simple enema every morning empties the lower part of the intestine and answers every purpose.

THE PSYCHOSIS OCCURRING DURING THE COURSE OF PERNICIOUS ANEMIA

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In reporting the two following cases I wish to call attention to the abnormal *mental* condition occurring during the course of pernicious anemia, not coming especially as one of the final complications of the disease. It is perhaps of little moment to see such a condition occurring as one of the late complications, but we infrequently read in the literature of a well-defined psychosis making its appearance weeks and months previous to the death of the individual.

CASE REPORTS

CASE 1. (No. 8043).—Male, white, aged 52, farmer. Admitted to the Columbus State Hospital Dec. 24, 1912. Commitment papers state that the "onset has been gradual, that he is suffering from pernicious anemia with peripheral neuritis, is at times excited and dangerous, threatening to kill different members of the family. Has hallucinations and thinks that different persons were trying to kill him. Is insanely jealous of his wife; at times having violent, mad fits." When admitted to the hospital the patient appeared intensely sick and was unable to walk without assistance, having marked dyspnea on the slightest exertion. He was at once placed in bed and the initial examination showed him to be a man of quite marked intelligence, possessing quite a little insight into his present condition, oriented as to location and apparently well satisfied. He realized that he was quite sick physically and desired to do all that he could to improve his condition. From his history we learn that he has been quite a prosperous man and for many years his married life was happy.

Finally, of his own accord and for no real cause he separated from his first wife. He soon married, but his second union had been unhappy. For the past few weeks he had been very suspicious of his second wife, thinking that she was trying to poison him, or in some other way cause his death. He gave as his reason for such belief that his second wife had always been jealous of his first one. He also stated that because he had quite an estate his second wife was anxious that he die so that she would fall heir to his property. At different times during the examination he would close his statement with the remark that "although this seemed very real to him it must certainly be imaginary." He showed very little difficulty in speech, pronouncing test phrases quite well. There were never any convulsive attacks, blind or dizzy spells, and he claimed that he had never had any defect of memory.

In about three weeks after the first examination the patient showed some marked changes both physically and mentally. He was well oriented as to place but could not remember how long he had been in the hospital. At this time there was also some indecision in his own mind as to whether or not he had had any real mental trouble. He could see no reason why he should have been brought to the hospital. He grew very toxic at intervals, so that he was confused and disoriented in every field. When aroused from his lethargy he recognized those about him, but when left alone, soon relapsed into a semi-conscious condition. The functions of the arms and legs became less and less efficient and for two or three weeks previous to his death he was almost entirely helpless. He died March 17, 1913, three months after admission. When admitted physical examination was as follows:

Physical Examination on Admission.—Patient is 5 feet 5 inches in height, weight 131 pounds, light hair, blue eyes, pupils dilated equally, tongue clean, dark red in color; skin is clean, somewhat tinted with yellow, musculature very flabby, breath has bad odor, inguinal and postcervical glands enlarged, liver dulness increased downward. Examination of chest negative. Nervous system: right patellar tendon more active than the left, marked ankle-clonus of the right side. Romberg's sign present. Gait unsteady. At the time of admission to the hospital blood examination was practically negative, but from an examination made Oct. 15, 1912, by Dr. Frank Winders we learn that the hemoglobin was 40, red blood-cells 1,750,000, whites 5,200. Differential count—polynuclears 48, small mononuclears 40, large mononuclears 7, eosinophils 2, megaloblasts 3, normoblasts 4, 100 whites; color index plus; polychromatophilia, poikilocytosis. At the time of this examination patient was of a pure lemon tinge, there was marked throbbing of the muscles of the neck, severe dyspnea, palpitation of the heart and digestive disturbances. The heart was dilated. A loud systolic murmur was heard all over the cardiac region and transmitted to the large vessels of the neck. Blood-pressure 105. Pupils sluggish, no patellar reflexes present and there was some unsteadiness of the limbs and feet. The diagnosis was pernicious anemia with very unfavorable prognosis; in fact, the patient was not expected to live more than three or four weeks. It was possible to obtain consent for only a partial necropsy.

Necropsy.—All the fatty tissue showed the characteristic lemon color. The left kidney was malformed, showing some old scars or contractures. The spleen was enlarged and intensely congested—a large splenic tumor. Liver was enlarged, markedly congested. Gall-bladder distended with bile, but no stones. Lungs on each side contained air but were bound down by adhesions. The heart was smaller than normal and full of clot; pericardium very yellow. The intercostal as well as the other muscles examined were of a deeper red color than normal. The brain and spinal cord were not examined. Other organs were opened *in situ* and replaced. From the gross examination the diagnosis of pernicious anemia was made.

CASE 2 (No. 8206).—Male, white, aged 55, farmer; committed to the Columbus State Hospital June 14, 1913. The commitment papers stated that he was excited, had delusions concerning his previous medical treatment and also at times had delusions of persecution and of accusation. He, at

times, manifested quite marked mental disturbances. According to the statements of the committing physicians he was thought to have advanced pulmonary tuberculosis.

When admitted to the hospital the patient was quiet and well behaved. He was placed in bed and given the usual routine treatment and the preliminary examination revealed the following mental state:

Preliminary Examination.—"The patient is unable to tell where he is, the day, the month, or the year, and concludes his answers with 'I have been doped up so much that my ears ring.' He confuses his present location with the place—county infirmary—where he had been an inmate several weeks previously. He insists that he has had no trouble with his mind and that the immense amount of medicine he has taken is responsible in every way for any peculiar symptoms he may manifest. Although he complains of some roaring in his head he has no clear-cut hallucinations. His memory shows lack of accuracy for both recent and remote events and his general mood is much happier than his physical condition would warrant."

Examination.—A month after his admission he still showed temporal, spatial and personal disorientation. During a conversation he disclosed delusions of persecution, hallucinations of sound and illusions, and during the entire examination there was failing attention and lack of appreciation of his condition. He was much reduced physically and the skin showed a well pronounced lemon yellow tint. Aside from some slight paresthesias the nervous system was negative. The blood examination at this time showed a marked pernicious anemia.

During the last two or three weeks of his illness he manifested marked signs of cerebral anemia, the roaring in his head becoming much more severe, vertigo was constant and unless assisted he was not able to walk. His sensibilities were diminished and he gradually grew so clouded that he could not converse with those about him. Death occurred Aug. 4, 1913, about seven weeks after admission. There was no necropsy.

DISCUSSION

When we attempt to classify these two cases we find no definite group in which to place them, unless it should be with the intoxication psychoses. To summarize, we have two individuals with well defined pernicious anemia, showing in common many mental signs, namely, lack of orientation—in the one case in every field and in the other especially in regard to place; lack of insight; such delusions as we commonly meet in paranoid states—those of a persecutory type; the memory in one case apparently normal, until late in the condition, while in the other there was lack of accuracy for both recent and remote events; the mood in both parties much happier than the physical condition would warrant; lack of attention and appreciation, and numerous physical signs such as paresthesias, diminished sensibilities, vertigo, speech disturbances, loss of functions of the arms and legs, ankle-clonus, unequal patellar reflexes, Romberg signs, unsteady gait. Apart from the abnormal mental conditions present it is evident that we are dealing with some lesions of the brain and spinal cord, such as have been described by various writers in their reports of cases.

Hereditary Development and Differentiation.—Hereditry may be defined as the particular germinal organization which is transmitted from one generation to the next. Inheritance or heritage is the sum of all those qualities which are determined or caused by this germinal organization, by which it is transformed into the adult organization. Differentiation is the formation and localization of many different kinds of substances out of the germinal substances, of many different structures and functions out of the relatively simple structures and functions of the oosperm.—Edwin Grant Conklin, *Pop. Sc. Month.*

THE BACTERIOLOGY OF TYPHUS FEVER *

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The relatively recent experiments of Nicolle,¹ Ricketts and Wilder,² Anderson and Goldberger,³ revealing the manner in which typhus fever was borne from patient to patient by lice, and the later investigations of Anderson and Goldberger³ proving the identity of Brill's disease with typhus fever, have aroused new interest in this disease and the next step toward the solution of its etiology, the discovery of the specific germ, is awaited expectantly.

The bacteriology of typhus has been studied for years and numerous investigators have reported the discovery of organisms in typhus blood. No one of them, however, has thus far been able to establish the specificity of any particular organism. In general the students of the disease may be grouped into two camps, the one championing a protozoan etiology, the other maintaining that typhus is caused by a bacterium.

Among the first important investigations were those of Hlava⁴ (1888), who grew a streptobacillus from the blood and spleen of twenty of thirty-three patients, but who considered more important a protozoan which he later (1892) advanced as the cause of typhus. Thoinot and Calmette⁵ in 1891 found small, actively motile threads, flagellates, which disappeared from the blood in twenty-four hours, and Gotschlich⁶ described minutely an intracorpuseular protozoan which he classified as "pyroplasma bigeminum." Dreyer,⁷ Kireef⁸ and others were unable to confirm these observations. More recently Krompecker, Goldzieher and Augyan⁹ obtained a variety of different organisms from the blood, streptococci, and staphylococci, Friedländer's bacillus and others, but considered more important than these bacteria certain structures resembling malarial plasmodia which they found both within the blood corpuscles and free in the plasma; oval, pear-shaped and rod-like bodies taking an intense blue stain with Giemsa. Very recently Hegler and von Prowazek¹⁰ have described minute bodies filling many of the leukocytes and found also free in the plasma, taking a deep red stain with Giemsa considered to be stronglyloplasma. They were found both in patients and in infected apes, but not constantly.

* From the Memorial Institute for Infectious Diseases, Chicago.

1. Nicolle, *Compte and Conseil: Transmission experimentals du typhus exanthematique par le pou de corps*, *Compt. rend. Acad. d. sc.*, 1909, p. 149.

2. Ricketts and Wilder: The Transmission of the Typhus Fever of Mexico (Tabardillo) by means of the Louse (*Pediculus Vestimentis*). *The Journal A. M. A.*, 1910, xiv, 1304; The Etiology of the Typhus Fever (Tabardillo) of Mexico City, *The Journal A. M. A.*, 1910, liv, 1373.

3. Anderson and Goldberger: On the Infectivity of Tabardillo, or Mexican Typhus, for Monkeys and Studies on Its Mode of Transmission, *Pub. Health Rep.*, 1909, xxiv, 1941; On the Etiology of Tabardillo or Mexican Typhus, *Jour. Med. Research*, 1910, xii, 409; The Relation of So-Called Brill's Disease to Typhus, *Pub. Health Rep.*, 1912, xxvii, 149.

4. Hlava: Sur le typhus exanthematique, *Semaine med.*, 1889, p. 420; *Centrabl. f. Bakteriöl.*, Orig., 1902, xxxii, 27.

5. Thoinot and Calmette: Note sur quelques examens du Sang dans le typhus exanthematique, *Ann. de l'Inst. Pasteur*, 1892, vi, 39.

6. Gotschlich: Ueber Protozoen befunde (Apiosoma) im Blute von Flecktyphuskranken, *Deutsch. med. Wehnschr.*, 1903, xxix, 329.

7. Dreyer: Untersuchungen über den Typhus exanthematicus in Egypten, *Arch. f. Schiff's u. Trop. Hyg.*, 1911, xv, 319.

8. Kireef: Bakteriologische Untersuchungen des Blutes bei Flecktyphus, *Centrabl. f. Bakteriöl.*, etc., 1905, xxxviii, 518.

9. Krompecker, Goldzieher and Augyan: Protozoenbefunde bei Typhus exanthematicus, *Centrabl. f. Bakteriöl.*, Orig., 1909, lix, 612.

10. Hegler and von Prowazek: Untersuchungen über Flecktyphus, *Berl. klin. Wehnschr.*, 1913, I, 2035.

The discovery that typhus is an insect-borne disease lent strength to the protozoan theory of its etiology because of analogy with such insect-borne infections as malaria, sleeping-sickness and relapsing fever. It is only more recently that instances of insect-borne bacterial diseases have come to light, but a consideration of these, of plague transmitted by the flea and rocky mountain spotted fever by the wood ticks, should warn against drawing too hasty conclusions about typhus.

Bacteria of all kinds have been described in the blood of typhus patients. Following Hlava came Lewaschew¹¹ in 1892 with cultures of micrococci and Dubief and Brühl¹² with delicate diplococci which were cultivated on the usual laboratory media. Balfour and Porter¹³ in 1899 described a diplococcus. Deserving of greater consideration, however, are the more recent investigations of Galesesco and Slatineano¹⁴ (1906), Klodnitsky¹⁵ (1907), Rabinowitsch¹⁶ (1908), Ricketts and Wilder² (1910), McCambell¹⁷ (1910), Predjet-schensky¹⁸ (1910), Fürth¹⁹ (1912) and Plotz²⁰ in 1914. All of these authors describe bacilli the descriptions of which bear a certain resemblance.

Galesesco and Slatineano¹⁴ observed in fresh preparations of blood, elements 2 to 3 microns in length with refractile poles, non-motile, polar-staining. These observations were not constant. The same authors also described a large number of other bacteria.

Klodnitsky¹⁵ in 1907 found thin bacilli in laked blood. In 1908 he obtained a culture of bacteria which proved highly virulent for mice. Artz and Kerl²¹ were unable to confirm this observation.

Rabinowitsch¹⁶ observed in the peripheral blood diplococci and rods which by Giemsa stain show a lighter middle zone. The cultures contained Gram-positive diplobacilli. In the first generation these were agglutinable by typhus serum, but not later, which is explained by Rabinowitsch in a subsequent paper by the sticky character of the colonies and the difficulty in making homogeneous suspensions. The cultures were pathogenic for guinea-pigs and rabbits, producing a disease much like typhus in man. Later, in 1912, Rabinowitsch obtained inconstantly a complement deviation, using an extract of culture as antigen. Cultures older than two months proved unavailable. The patient's serum (antibody) had to be taken not earlier than the sixth day of convalescence.

In December 1909 an investigation of typhus fever in Mexico City was undertaken by Ricketts and

myself.² Blood serum of typhus fever patients was found to be sterilized by filtration through Berkefeld filters, an observation which was subsequently confirmed by others, and it was the encouragement offered by the results of these experiments that prompted the careful attention which we then bestowed on the microscopic examination of the blood of typhus patients and the organs of infected lice. If the organisms were large enough to be held back by the filter, they should be visible with the powers of the microscope. By these investigations we obtained results which were reported in April, 1910, as follows:

1. In the stained (Giemsa) preparation of the blood of patients, taken on from the seventh to the twelfth day of the disease, we invariably have found a short bacillus which has roughly the morphology of those which belong to the "hemorrhagic septicemia group." Usually it appears to stain solidly, but on minute examination an unstained or faintly stained bar is seen to extend across the middle. Occasionally two organisms are seen end to end. Exact measurements have not been made, but when compared with the size of the erythrocyte, their length is estimated at hardly more than two micromillimeters, and their diameter at about one-third of this figure. Certain other bodies, the identity of which is not so clear, may represent degeneration or involution forms of the above. They consist of two stained granules, connected by an "intermediate substance," which is stained faintly blue or not at all. Frequently one of these granules, or "poles," is larger than the other and stained a deep purple, whereas the smaller takes a faint blue color.

2. In moist preparations of the blood of patients, bacillary bodies, with a structure like that mentioned above, have been encountered in all cases. The differentiation of the forms into two halves, separated by a line or narrow zone of a substance of different refractive power, may be observed. They possess no active motility, but vibrate more or less rapidly.

3. The dejecta and various organs of a large series of lice have been stained in a similar way and examined for the presence of micro-organisms. Certain groups have been deliberately infected by permitting the lice to feed on patients, while others were supposedly normal, having been collected from healthy individuals. Streptococci, staphylococci, an oval bacillus occurring in clusters, and certain solid-staining bacilli are encountered irregularly and indifferently in the feces and intestinal contents of both "normal" and "infected" lice. Polar-staining organisms have been found occasionally in the feces and intestinal content of "normal" lice, whereas they are present almost constantly, and often in large numbers, in similar material from "infected" individuals.

Protozoa have not been recognized.

These observations were reached quite independently, as Rabinowitsch's publication in 1908 had not come to our attention and the more extensive reports appeared later.

During these earlier investigations I tried to obtain further proof of the specificity of our organism by making an emulsion of the organisms of infected lice in which the bacilli were numerous and attempting agglutination with serum from convalescent patients. These experiments were not reported, as they involved a rather difficult interpretation, the emulsions containing many contaminating bacteria. I felt, however, fairly convinced that the bipolar bacilli were agglutinated; the preparations with typhus serum differed markedly from the controls with normal serum.

Our investigations included the study of some thirty infected monkeys and a hundred or more patients and in every case blood cultures were made. As mediums agar and large flasks of broth were used and no cul-

11. Lewaschew: Ueber die Mikroorganismen des Flecktyphus, Deutsch. med. Wchnschr., 1892, xviii, 279.

12. Dubief and Brühl: Contribut à l'étude anatomo-patheologique et bactériologique du typhus exanthématique, Arch. de méd. exper., 1894, vi, 224.

13. Balfour and Porter: Edinburgh Med. Jour., 1899, vi, 522.

14. Galesesco and Slatineano: Recherches bactériologiques faites à l'occasion de l'épidémie de typhus exanthématique de Bucarest, Compt. rend. Soc. de biol., 1906, xxv, 14.

15. Klodnitsky: Russky Vratsch, 1907, p. 1008; Beobachtungen über Flecktyphus in Astrachan in den Jahren 1907-1909, Centralbl. f. Bakteriologie, 1913, lxvii, 338.

16. Rabinowitsch: Ueber die Flecktyphusepidemie in Kiew, Centralbl. f. Bakteriologie, Orig., 1909, lii, 173.

17. McCambell: Observations on Typhus Exanthematicus (Tabardillo) in Mexico, Jour. Med. Research, 1910, xxiii, 71.

18. Predjet-schensky: Zur Frage über den Flecktyphuserreger, Centralbl. f. Bakteriologie, Orig., 1910, lv, 212; Weitere Untersuchungen über den Flecktyphuserreger, Centralbl. f. Bakteriologie, Orig., 58, 1911, lviii, 106.

19. Fürth: Zur Bakteriologie und Epidemiologie des Typhus exanthematicus, Ref. Centralbl. f. Bakteriologie, etc., 1914, li, 79; Neuere Untersuchungen über Flecktyphus, Arch. f. Schiffs u. Trop. Hyg., 1912, xvi, 241; Die Flecktyphuserkrankung des Frühjahrs 1911 in Tsingtau und Untersuchungen über den Erreger des Flecktyphus, Ztschr. f. Hyg. u. Infektionskr., 1912, lxx, 333.

20. Plotz: The Etiology of Typhus Fever (and of Brill's Disease); Preliminary Communication, THE JOURNAL A. M. A., 1914, lxiii, 1556.

21. Artz und Kerl: Ueber den Typhus exanthematicus, Arch. f. Derm. u. Syph., Orig., 1913, cxviii, 387.

tures were diagnosed before a week of incubation; in only two instances did any of the flasks contain any growth and these were obviously contaminations. The cultures were made as a control of our work on transmission, but the results are independently important in that they show the difficulty in the cultivation of the typhus bacteria. To my mind they cast some doubt on the results of those experimenters who have reported the cultivation of bacteria on these ordinary media.

Our observation of bipolar organisms in the blood was later confirmed by Gavino and Girard,²² by Nicolle² and by Hegler and von Prowazek.¹⁰ I²³ have since reexamined the blood preparations made during our earlier study and feel quite certain that our findings are as significant as we then thought them to be. In reply to the criticism of Nicolle and others that these organisms are present in the blood in too small numbers to be accepted as the cause of the disease, I would call attention to the scarcity of bacilli in the blood of typhoid patients (*Typhus abdominalis*) and the difficulty in finding diplococci in the blood of pneumonics.

Following the publication of our observations appeared researches by Wilson²⁴ who cultivated a diplococcus in fifteen of thirty-three cases, and the investigations of McCambell¹⁷ who observed organisms in the blood which gave the impression of being diplococci, but on closer study were shown to be bacilli with polar staining. McCambell made cultures on a variety of media, but all were negative.

In 1910 also appeared the publications of Predjetschensky¹⁸ who observed in blood, urine and sputum an organism, usually rod-like, at times a diplobacillus, Gram-negative, non-motile, polar-staining. Cultures were positive in 100 cases when made between the sixth and ninth day of the disease, 2 to 5 c.c. of blood being implanted in 200 c.c. of broth, growth visible after twenty-four or forty-eight hours. The organism proved pathogenic for mice and guinea-pigs, was agglutinated by typhus serum but only in strong dilutions, 1:10 in one hour and 1:40 in four hours. Other immunologic tests are not reported, nor is there any proof that the animals for which the germs proved toxic had developed actual typhus fever.

Silberberg²⁵ in 1912 found in the cerebrospinal fluid a micrococcus which showed a clear middle zone, and Fürth¹⁹ in 1912 described in the blood a short, thick bacillus with a clear central zone which proved cultivable in 38 per cent. of cases. The growth was difficult and polymorphous tendencies were exhibited on artificial media. Agglutination with typhus serum was indefinite and only a slight pathogenicity was found for apes, guinea-pigs and rats.

In 1913 Müller obtained cultures of a diplobacillus in five of eleven cases of typhus. The organism was Gram-positive at first, subcultures Gram-negative, slightly toxic for mice but non-toxic for macacus monkeys. He believes it the same organism as that described by Fürth, Rabinowitsch and Predjetschensky.

Finally and to my mind most encouraging, is the recent report of Plotz.²⁰ Plotz made anaerobic cultures

of typhus blood, which in my opinion was a wise procedure, and, although his methods are not described in the preliminary report, he seems to have succeeded in obtaining eleven positive cultures in twelve cases of typhus fever, six of these being the milder Brill's disease. The cultures when injected into guinea-pigs produced a febrile reaction similar to that which occurs after inoculation of typhus blood. Complement deviation was obtained in six of eight cases, using an antigen made from the bacillus and serum from patients after crisis. The morphologic description is as follows:

The organism is a small Gram-positive pleomorphic bacillus from 0.9 to 1.93 microns in length, the breadth being from one-fifth to three-fifths the length. It is non acid-fast, has no capsule or polar bodies and can be demonstrated with appropriate methods.

This description agrees rather closely with that of the structures observed in typhus blood by Ricketts and myself and with the observations of several of the more recent investigators. It would seem that many of us have been interested in the same organism. If later work bears out these earlier studies, typhus fever must be included in the group of insect-borne bacterial diseases and grouped together with plague and Rocky Mountain spotted fever. It is worthy of note that both of these diseases are caused by bipolar bacilli that resemble the organism probably responsible for typhus. This close relationship of typhus with plague and Rocky Mountain spotted fever was suspected by Ricketts some time before our investigations of typhus were undertaken.

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STUDIES CONCERNING DIABETES *

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The work, of which this paper will give a synopsis, is the continuation of an experimental study of diabetes described in detail elsewhere.¹ Certain of the results of the previous investigation, bearing on the present topic, may be summarized under the following four headings:

1. Production of Diabetes: Removal of portions of the dog's pancreas produces a lowering of the sugar tolerance. Removal of nine-tenths of the gland results in severe diabetes. When the remnant is larger (for instance, one-eighth), milder types of diabetes result. The course is chronic, extending over months, and the end fatal. Such animals furnish a closer imitation of human diabetes than is produced by total pancreatectomy.

2. Pathologic Anatomy of Diabetes: In the foregoing procedure, duct communication between the pancreatic remnant and the duodenum is preserved. Therefore the acinar tissue does not atrophy, and in some cases it may hypertrophy. The islands of Langerhans show typical progressive alterations, which may be summarized as vacuolation of cytoplasm and loss of granulation, pyknosis of nuclei, loss of cells, and

22. Gavino and Girard: Nota preliminar sobre el Tifo experimental en los Monos inferiores, etc., Publ. del Institut Bacter. Nacional de Mexico, 1910.

23. Wilder: The Problems of Transmission in Typhus Fever, Jour. Infect. Dis., 1911, ix, 11.

24. Wilson: The Etiology of Typhus Fever, Jour. Hyg., 1910, x, 155.

25. Silberberg: Bakteriologische Untersuchung der Cerebrospinalflüssigkeit bei Typhus exanthematicus, Ref. Centralbl. f. Bakteriöl., 1912, liii, 327.

* Read before the Section on Pathology and Physiology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

* From the Hospital of The Rockefeller Institute for Medical Research.

1. Allen, Frederick M.: Studies Concerning Glycosuria and Diabetes, Harvard University Press, Cambridge, Mass., 1913.

finally disappearance of islands. By suitable controls the changes were shown to be specific to diabetes. Homans² has made a careful histologic study of such changes in the islands of diabetic cats by the aid of the admirable methods of Bensley.

3. Pathologic Physiology of Diabetes: An idea has long existed that the disturbance of carbohydrate metabolism in diabetes might perhaps be explained by the assumption that sugar exists in a combined form in the normal body, but that this combination is lacking in diabetes. In the diuretic behavior of dextrose in diabetic and non-diabetic animals, I found contrasts which were interpreted as evidence in favor of this conception, which was therefore put forward as a hypothesis to explain the various phenomena of diabetes. The combining substance was designated by the figurative title of "amboceptor," to indicate its function as a bond between tissue and sugar. The substance which thus combines with dextrose, or some link in the combination, is supposed to be furnished by the islands of Langerhans. For details concerning the hypothesis and the evidence, reference must be made to the original publication.

4. Prevention or Checking of Diabetes: Under certain conditions the presence or absence of experimental diabetes may be determined by the patency of the pancreatic duct. When the pancreatic remnant is sufficiently small, diabetes results, even if this remnant is cut off from duct communication. But, with a slightly greater size of pancreas-remnant, it is possible under favorable conditions in certain cases to show that diabetes occurs if the duct is patent, but remains absent if the duct is ligated. Particularly in one instance it was shown that a diabetes already begun stopped when the duct was ligated. The period during which diabetes can thus be prevented is necessarily limited, since ligation of the duct produces in the dog gradual atrophy and degeneration of all the elements of the pancreas, and this gives rise after weeks or months to the Sandmeyer type of diabetes.

PRESENT INVESTIGATION

The present research has advanced along the same lines as the preceding one, and has kept in view the same clinical purpose.

I. PRODUCTION OF EXPERIMENTAL DIABETES

A. By Operation

Of several species of animals tried, the dog and cat are the most convenient and useful. Rapid death from cachexia, which I previously described as an occasional occurrence in dogs, is more frequent in cats. In them diabetes is intense and life short after removal of nine-tenths of the pancreas; but by removal of fractions such as three-fourths, four-fifths and five-sixths of the pancreas, one obtains mild or severe forms of diabetes as desired, and such cats live for weeks or months. In cats, more readily than in dogs, can thus be produced mild, transitory, intermittent forms of glycosuria, doing the animal little or no harm, and determined largely by diet (as milk, or sometimes even the feeding of liver instead of ordinary meat). There is a decided tendency toward recovery, though aggravation can often be produced by continuance of improper diet. This form of diabetes may be compared to those mild, intermittent, relatively benign

human cases which some persons have supposed to be not of pancreatic origin.

With respect to dogs, the figures given above concerning size of pancreas-remnants hold good for medium-sized animals, such as were convenient for the purposes of the previous research. Present findings indicate that the size of the pancreas in proportion to body-weight in large and small dogs may vary considerably, and that the size of the pancreas-remnant which permits diabetes may vary correspondingly, though a longer series of observations must be completed before making more precise statements. In cats variations of this character are absent or less marked.

B. By Diet

The papers of Thiroloix and Jacob, previously reviewed, report success in a line of experiment in which earlier workers failed. They state that some dogs after partial pancreatectomy are free from glycosuria on meat diet, but show glycosuria when carbohydrate is fed; and that continuance of carbohydrate diet finally brings the animals into a state of severe diabetes in which they excrete sugar even on meat diet. The reports of the French authors are brief, and contain no mention of controls or proof that such dogs might not ultimately develop severe diabetes, even without carbohydrate feeding. These may perhaps be the reasons why this discovery has received practically no notice in the literature. Independently of these writers I had made similar observations, and believing them to be of importance, I have repeated and extended the work. Based on the experiments so far conducted, it is possible to make the following statements:

1. After removal of sufficiently large fractions of the pancreas, as above described, dogs develop a severe diabetes, in which they show heavy glycosuria on meat diet and also during considerable periods of fasting. The condition progresses steadily downward to a fatal end.

2. When the remnant of pancreas left *in situ* is slightly larger, a condition may be produced in which the fate depends on the diet. On meat feeding such a dog is free from glycosuria and remains so for months, eating his fill every day and maintaining full health and nutrition, with no sign of downward progress; but subcutaneous tests show that the dextrose tolerance is very low, and bread feeding readily produces glycosuria. A return to meat diet stops the glycosuria; but if the bread diet and accompanying glycosuria are maintained for too long a time, the glycosuria then continues, even on meat feeding. The diabetes thus produced is not inferior in severity to that resulting from simple removal of larger fractions of pancreatic tissue, and the downward course and fatal termination are similar.

3. When the pancreas-remnant is still larger, glycosuria is absent on meat diet, and on bread diet may be absent or transitory. Such animals may remain in excellent condition indefinitely on bread diet, free from glycosuria or any downward tendency; but if sufficient sugar is added to the diet, glycosuria can be produced and maintained. After a period of such glycosuria, the animal reaches a condition in which it is glycosuric on bread diet. By prolonging the glycosuria on bread diet, the dog finally reaches the condition of severe diabetes, with glycosuria on meat diet, and continuous downward progress. For such sugar feeding I have ordinarily used commercial glucose. The

2. Homans, John: Jour. Med. Research, 1914, xxx, 49.

experiments succeed best in greedy dogs and those naturally fond of sugar. A decided aversion to sugar on the part of the dog may spoil such an attempt through failure of appetite.

4. When the pancreas-remnant is still larger, sugar feeding may produce transitory glycosuria, but it cannot be made to continue. The sugar tolerance is lower than in normal dogs, but nevertheless the doses of sugar necessary to produce glycosuria are higher than can be tolerated as a daily routine by the gastrointestinal canal. Persistence in the attempt to maintain glycosuria causes diarrhea and illness. The dog refuses to eat, sugar given by stomach-tube is vomited, and true diabetes remains absent. Similar results can be obtained with cats by feeding carbohydrate in the form of milk.

The changes previously described as occurring in the islands of Langerhans occur whether the diabetes follows directly on the operation alone, or has been induced in the prepared animal by means of modification of diet. The best of the control animals are still alive; but the control tissues thus far examined indicate that in animals predisposed by operation, when diabetes is prevented by carbohydrate-free diet, the signs of exhaustion and degeneration in the islands of Langerhans are absent. If further study shows that this is the case, it will afford additional evidence that these changes have a direct relation to the diabetes and that they are a result of functional overstrain.

While various factors are undoubtedly concerned in the production of human diabetes, clinical observations indicate that diet is an important one. It is generally recognized that there is a higher incidence of diabetes among those races or classes of people who use an excess of carbohydrate. Luxurious living and sedentary life are thought to predispose to this disorder. The experimental observations on animals suggest an explanation of this relationship between diet and diabetes in the human subject. If individuals differ in the strength of the pancreatic function as in other functions, in some this may be so weak that diabetes comes on in early life irrespective of the diet. In others this function may be only a little stronger, so that diabetes may be delayed until later in life or even to the period of senility, when there occurs an impairment of various functions. Others may be more or less below the average in pancreatic functional power, but under ordinary circumstances this is sufficient to prevent the occurrence of diabetes. In these persons, however, who might otherwise go through life with no sign of diabetes, an excess of starch in the diet may serve as an exciting cause of diabetes, and the degree of such excess may help to determine the earlier or later onset and the milder or severer type of the disorder. In other persons of this sort, as in the corresponding type of dogs, the pancreatic function is able to deal safely with as much starch as can be digested, but a sufficient excess of sugar is an effectual cause of diabetes.

It is impossible to produce diabetes in the normal dog by an excess of carbohydrate feeding, since if too much sweet or starchy food is taken, indigestion results and automatically stops the ingestion. But in dogs after operation and in predisposed human patients, pancreatic weakness may reverse the normal relation, so that the organism can digest and absorb more carbohydrate than it can combine and assimilate; and in this condition the production of diabetes by improper diet is possible. The question of diabetes may then be regarded as a balance between the digestive and assim-

ilative functions. Moreover, the body is equipped with no natural safeguards against this unnatural condition. There is no reflex or other mechanism which points plainly to the cause of the trouble and compels its cessation. On the contrary, the impaired nutrition due to failure of assimilation affects the organism as if it were due to deprivation of food. The response commonly shows itself in the harmful form of increased appetite. The taking of excessive food injures the assimilation still further, and thus a vicious circle results.

II. PREVENTION OR CHECKING OF EXPERIMENTAL DIABETES

The therapeutic experiments in animals pertain to two groups of cases, those in which diabetes is produced by simple operation, and those in which diabetes is produced by diet in predisposed animals.

1. Animals made diabetic by operation. In animals from which an excessive amount of pancreatic tissue is removed, a diabetes may be obtained which is so severe that fasting will not produce sugar-freedom. But when the pancreas remnant is of suitable size, for example, one-tenth, though the resulting diabetes is permanent on meat diet and will end fatally if allowed to persist, nevertheless a few days of fasting at the outset will produce sugar-freedom. If the diabetes is allowed to continue longer, a much longer period of fasting may be necessary for sugar-freedom, or it may be impossible to obtain. If, after obtaining sugar-freedom, feeding of protein and fat (with occasional bones) is begun very cautiously, in quantity only enough to maintain the animal in its thin condition, such dogs remain free from diabetes. The longest experiment to date is that of a dog which, possessing less than one-tenth of the pancreas, has been kept free from diabetes for six months, and there is at present no indication that the condition cannot be continued indefinitely. If an attempt is made to increase the weight of such an animal, glycosuria soon appears and must be checked by renewed fasting. Such dogs, though very thin, are vigorous and lively. They contrast sharply with dogs which, after similar operations, are allowed to remain diabetic on full meat diet. Though the latter animals at first appear much better nourished, they finally emaciate in spite of the most enormous eating; and when they have become as thin as the dogs above described, weakness and cachexia are very evident, and the progress continues downward to death.

2. Animals made diabetic by diet. When the animal possesses perhaps an eighth or a sixth of the pancreas, and is not diabetic after operation but is then made diabetic by excess of carbohydrate, this diabetes at first can be stopped by a simple change to meat diet. After a longer duration, the diabetes no longer stops on carbohydrate-free diet; but after a period of fasting, the time depending on the severity of the diabetes, the urine becomes sugar-free. With still greater duration or severity of the diabetes, sugar-freedom is no longer obtainable by fasting. When such animals are made sugar-free, they may be kept so by the same procedure as described for those of the former group. When the diabetes is thus checked fairly early, it is evident that the prognosis is much more favorable than in animals of the previous group, for in the present animals the removal of pancreatic tissue was considerably less, and the cause of the diabetes is partly a functional change. Accordingly, it is found that the

diet can be gradually increased, and in favorable cases the animals be brought to a higher level of weight and nutrition than is ever possible with dogs of the preceding type. Up to the present, however, the experience has been that these dogs are never able to return quite to the condition which they enjoyed before the diabetes, and which is permanently maintained by similar dogs in which diabetes is prevented by suitably chosen diet from the outset. As above mentioned, dogs so treated can be kept indefinitely at full weight and well-being when placed after operation on a diet which keeps them free from glycosuria. But when diabetes gravis has been produced and allowed to continue long enough to demonstrate its reality, while it has been possible by the foregoing method to stop the diabetes and bring a dog back to within a kilogram of its normal weight, every attempt to produce a further gain in weight has brought a return of glycosuria, which must be checked by fasting. Such dogs, however, are so near to normal that, if they are mixed up in a yard with ordinary dogs, a stranger might be unable to tell one from the other.

The microscopic examinations of the pancreas remnants of such animals as have yet come to necropsy from both of these groups show that in both alike the island cells are well endowed with cytoplasm and granules, and degenerative processes are not seen; but there is a decided impression that the islands are inferior in both size and number to those of normal animals. If this impression proves valid in further experiments, a correlation readily suggests itself between the observed anatomic change and the diminished pancreatic function described in the preceding paragraph.

In my previous report I have shown that by removal of suitable fractions of the pancreas, animals may be brought so close to the verge of diabetes that the removal of less than a gram of additional pancreatic tissue suffices to bring on diabetes. According to the "amboceptor" hypothesis, the pancreas furnishes some definite substance or substances used by the cells of the body for the metabolism of carbohydrates and perhaps also of other foods, the "amboceptor" being used up in metabolism and bearing some quantitative relationship to the metabolism. Extending this theory to the foregoing experiment, one may say that the fragment of pancreas which barely prevents diabetes is the smallest fragment which can supply the minimum quantity of "amboceptor" necessary for the animal's metabolism. When such a pancreatic fragment is even slightly reduced, the supply becomes slightly deficient in quantity, and diabetes accordingly begins and runs the usual downward course.

Present observations prove that the reverse of this experiment is likewise possible, that is, when an animal and its food consumption are suitably reduced, a pancreatic remnant otherwise inadequate becomes adequate; diabetes under these conditions may be prevented or be checked after it has appeared. Prevention or cessation of diabetes previously observed in consequence of ligation of the pancreatic duct may be explained by the impaired food absorption and chronic malnutrition of the animal. Similarly in dogs which develop distemper after the pancreatic operation, and which therefore refuse food and emaciate rapidly, diabetes may fail to appear or may stop after it has appeared. Interpreting these experiments on the basis of the "amboceptor" hypothesis, one may say that an otherwise insufficient amount of "ambo-

ceptor" may become sufficient when the metabolism of the body is artificially diminished.

III. CLINICAL TREATMENT OF DIABETES

In the clinical literature of diabetes there are authentic reports of certain cases in which even severe diabetes has cleared up spontaneously and completely on the onset of cirrhosis of the liver, cancer, tuberculosis or some other wasting condition. Other cases have notably improved. Probably the most severe and certainly the best studied of such examples was presented by one of Joslin's patients,³ in whom a long-standing and dangerous acidosis disappeared entirely, and a negative carbohydrate balance became positive, following the onset of tuberculosis. When these cases are considered in the light of the experimental study of animals, the possibility is suggested that we have an indication for a rational method of dealing with diabetes, or impaired pancreatic function associated with overstrain.

Notice should be taken of the advantage possessed by most diabetic human patients over diabetic dogs. Even the most hopeful of the above-described dogs has only a small fraction of the pancreas. Most of the organ is hopelessly gone, and the presence or absence of diabetes is determined by functional influences acting on the little remnant. Furthermore, even when the diabetes is inaugurated by functional means, the organic degenerative changes quickly ensue in the islands of Langerhans. Under these conditions it is surprising that results are obtainable by treatment at all. On the contrary, in typical human diabetes the entire pancreas is present, and there are indications that functional disturbance is an important factor.

It has been thought justifiable, therefore, to undertake the treatment of a limited number of patients by a method based on the principles derived from the experimental work as indicated in this communication. The number of patients so far treated is limited, but the results obtained indicate that the same method employed in rendering the diabetic dog free of glycosuria and prolonging its life is efficacious in eliminating glycosuria and acidosis in the human patient. To what extent life may be prolonged by this method only a large statistical study will show. The observations so far indicate that the method is not harmful, and when carried out carefully seems definitely beneficial.

The method of treatment is in brief as follows: If the patient is moderately emaciated, with a negative carbohydrate balance and acidosis, he is put to bed and receives no food whatever. If coma seems imminent the usual emergency treatment with purging, stimulants, alkalies and large amounts of water should, of course, be carried out. In addition to fasting, alcohol is important in the treatment at this stage. From 50 to 250 c.c. of whisky or brandy may be given in each twenty-four hours in small doses, from 10 to 20 c.c. every one to three hours during the twenty-four. As soon as the glycosuria stops and the acidosis diminishes, which even in severe cases may be within forty-eight to ninety-six hours, the amount of alcohol and alkali may be reduced. Fasting and moderate dosage of alcohol are continued for from twenty-four to forty-eight hours longer, however, depending on the patient's strength. The alkali is now stopped, and feeding with starch is commenced in order to clear

3. Benedict, Francis G. and Joslin, Elliott P.: A Study of Metabolism in Severe Diabetes, Carnegie Institution of Washington, 1912, Case R, p. 55.

up the last traces of ketonuria. The kind of starch is of minor importance. Green vegetables are useful because their carbohydrate and food value is so low that they can be given in considerable bulk, and this bulk is agreeable to the patient for relieving his feeling of emptiness. Neither fat nor protein is added. For the first day, the food is chosen to represent a carbohydrate content of from 10 to 40 gm. This is divided into four to ten equal portions and fed at equal intervals during the day. If glycosuria remains absent, the ration for the next day is doubled, to represent 20 to 80 gm. of carbohydrate, similarly divided into numerous small portions. On the next day it is sometimes possible to increase the ration to 100 gm. of carbohydrate, without glycosuria. About this time, especially if glycosuria has appeared, another fast-day is interposed, from 50 to 200 c.c. of whisky being given. Present experience indicates that even in severe cases ketonuria may by this method be made to disappear entirely. Several repetitions of the foregoing routine may be necessary for this purpose. All food contains danger, tending toward either glycosuria or ketonuria. The carbohydrate of the diet is seldom reduced below 50 gm., and is preferably kept higher. If carbohydrate must be kept low, the total diet is kept low. The diet is so chosen that glycosuria, not ketonuria, is the signal of overstrain. Fasting-alcohol days are given not merely whenever this signal appears, but also at close enough intervals to prevent it from appearing, even every two or three days if necessary. If there has been no glycosuria, a slight addition to the diet is made after each fast-day. Each day's diet is calculated exactly, and the nitrogen-balance is watched. It is thought that no matter how low the assimilative power, the attempt to feed in excess of this power is harmful, and it is possible that by rest the assimilative function may gradually become stronger. With improvement in the patient's condition, the carbohydrate in the diet is further increased. Increase in weight, however, is not attempted at this time. From our present point of view, contrary to the generally held opinions, the attempt to increase weight should be the last rather than the first step in treatment. It is attempted to keep the metabolism at the lowest safe level until the patient is taking from 100 to 150 gm. of carbohydrate (mostly as green vegetables) daily, with fast-days interposed often enough to prevent any trace of glycosuria from appearing. Then protein is cautiously added, always being kept rather low; and in favorable cases the weight and well-being may finally improve under gradual additions of fat.

The radical procedure here described is that used for the most severe cases. In milder cases the treatment may be correspondingly milder. Primary loss of weight is intentional. The purpose of the treatment is not to confer temporary comfort or appearance of well-being, though various symptoms, including polyphagia and asthenia, may actually be relieved. When there is extreme cachexia and emaciation, the difficulty is greatest. It may then be necessary to juggle very carefully the three factors of glycosuria, acidosis and nutrition.

A report giving the results of this form of treatment in a series of cases will be published later. It is felt that the conception underlying this method of treatment, based on experimental observations, is new, though certain details have long been recognized as of importance. According to this method, alkali treat-

ment is not employed, unless for a brief period at the outset, while severe acidosis is being combated. The alkali treatment has been called the most brilliant discovery in the modern study of diabetic therapy. It is indeed a valuable means for facilitating the excretion of acetone bodies. But under an efficient treatment of diabetes, acetone bodies should not be excreted. They should be burned.

Though it seems possible thus to check all active symptoms, with apparent benefit, even in very severe cases, yet it is felt that the ultimate outlook for these patients is far less favorable than it would be if they could be treated earlier. The best therapeutic hope is believed to lie in the application of this principle of treatment at the earliest possible stage in diabetes.

ABSTRACT OF DISCUSSION

PROF. A. J. CARLSON, Chicago: Does Dr. Allen consider the evidence conclusive that mere obstruction of the pancreatic duct in dogs leads to the atrophy of all the elements in the pancreas? In the rabbit this is not the case. I have seen in dogs, in connection with other work, the islands persist for six or nine months, that is, enough of the island tissue to prevent diabetes.

DR. ALLAN C. EUSTIS, New Orleans: Has Dr. Allen noticed the appearance of the acetone bodies in the urine of these dogs; whether they were present during the fasting stages and how soon they would appear; and also whether the amount of the pancreas left in had anything to do with the rapidity with which the acetone bodies appeared?

DR. F. M. ALLEN, New York: Answering the latter question first, I have never seen a satisfactory reproduction of human acidosis in dogs. A few authors have reported considerable acidosis in totally depancreatized dogs, and even death in coma, but these cases are the exception rather than the rule. The difference between carnivorous animals and man as respects acidosis is one reason for attempting to reproduce diabetes in other species which are more like the human in this respect. With regard to Dr. Carlson's question, two factors must be considered; one is species, and the other is time. In rabbits and guinea-pigs, following ligation of the pancreatic duct, authors have proved that numerous normal-appearing islands of Langerhans are present long after the disappearance of all acinus tissue. The pancreas is described as being replaced by fibrofatty tissue and though the islands pass through phases of degeneration and regeneration, the island tissue is not permanently destroyed but apparently persists indefinitely. Such animals are free from diabetes, but it has never been proved that true diabetes can be produced in these species by any means. In dogs, on the other hand, ligation of the pancreatic duct is followed by scar-tissue formation, and islands as well as acini are destroyed. Such degeneration of a ligated pancreas-remnant gives rise to the Sandmeyer type of diabetes. In the dense fibrous tissue at the site of the pancreas in dogs dead from prolonged Sandmeyer diabetes, it is said that neither acini nor islands have been found. The time-element is involved in experiments such as Macalлум's, which undertake to show that islands persist at a time when all acini have disappeared, and that the dog at this time is not diabetic. Positive results in such experiments may furnish evidence in favor of the insular hypothesis; nevertheless after a longer time-interval the islands may be expected to degenerate and disappear. Indefinite persistence of islands in the ligated pancreas, as proved for the rabbit, has never been shown in the dog.

The Eye Sees Only What it is Trained to See.—How many eyes—yes, and skilled eyes, too—looked at the thorax and never saw the so-called Litten's sign or diaphragm phenomenon? Many of us look at it every day and fail to see it, even after we know about it. How often does the diagnosis of a thoracic aneurysm go begging for want of a careful glance?—Thomas McCrae, *Canadian Med. Assn. Jour.*

THE INFLUENCE OF SWEAT BATHS ON THE NON-PROTEIN NITROGEN CONTENT OF THE BLOOD IN NEPHRITICS*

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The present study is based on the supposition that by the use of the recently acquired accurate methods for estimating the non-protein nitrogen of the blood, it might be possible to determine with greater precision than formerly the effects of sweat baths on the blood in nephritis. The sweat bath, advocated first for the removal of fluid from individuals with diseased kidneys, has more recently been extensively employed for the purpose of increasing the elimination of such solids as are normally excreted by the kidneys. Certain early observations seemed to afford a basis for such a procedure. It was found that in some nephritics, after sweating, a deposit was present on the skin which on analysis proved to be rich in urea. It was soon shown, however, that this phenomenon occurs only in agonal states or in conditions of extreme collapse when the permeability of the capillaries is quite abnormal and is in no sense comparable to that obtained under the conditions of the ordinary therapeutic sweat bath.

The chief method of approaching this problem experimentally has been by a study of the amount and composition of the sweat obtained. Both Strauss¹ and Bendix,² by freezing-point determination, found sweat to be of a lower concentration than the blood, from which it might be expected that sweating would lead to a greater concentration of the blood. Bendix failed, however, to demonstrate any lowering of the freezing-point of the blood after a sweat, and in one nephritic found an elevation. On the other hand, Georgopoulos³ noted in two nephritics a trifling, probably negligible, depression of the freezing-point of the blood after sweat baths. Von Noorden⁴ collected the sweat during sweat baths and estimated the quantities of nitrogen and of sodium chlorid recovered, and as a result found great variations in the output by different individuals, by the same individual at different times, and from different skin areas of the same individual. From his observations he concluded, however, that a nephritic, in the course of an hour's sweat, might excrete not more than 1 gm. nitrogen or 2 gm. sodium chlorid. In a very recent study Plaggemeyer and Marshall⁵ have estimated the nitrogen of the sweat obtained from fifteen normal indi-

viduals during a hot air bath lasting for twenty-five minutes after the onset of sweating. They found outputs of nitrogen ranging from 34 to 640 mg. The amount of nitrogen per hundred gm. of sweat ranged from 67 to 194 mg., a concentration much above the normal non-protein nitrogen concentration of the blood, and higher than that of most nephritics. Their study would apparently suggest the possibility of reducing the non-protein nitrogen concentration of the blood by such procedures.

Loofs,⁶ and later Tachau,⁷ studying the output of nitrogen and chlorids throughout the entire twenty-four hours in the sweat of non-nephritic as compared with nephritic individuals, reached different conclusions: the former finding a similar output in the two classes whereas the latter obtained, on the average, a slightly higher output in the nephritics, and a much higher output in one case of contracted kidney secondary to chronic lead poisoning.

Thus we see that hitherto the study of the value of sweating, in its influence on the nitrogen content of the blood, has been attacked chiefly by the estimation of the composition of the sweat itself. We feel, however, that, in the recently developed technic of Folin and Denis, we have at hand a means of attacking this problem more directly, in that it is possible to determine the composition of the blood itself, as regards its nitrogen content, before and after sweating. For this purpose we have made use of eleven patients of the type that customarily receives sweat baths for therapeutic purposes.

EFFECT OF SWEAT BATHS ON TOTAL UNCOAGULABLE NITROGEN OF THE BLOOD OF NEPHRITICS

Name	Sys. Bl. Pr.	Phthalein Test*	Before Bath	Nitrogen† Immediately after Bath	1-4 Hrs. after Bath
Li	169	30	32	..	33
Sh.	145	30	33	..	30
Sn.	195	35	33	..	36
Hi.	140	35	36	..	31
Th.	180	40	37	..	39
Fa.	170	25	46	47	48
Wi.	260	45	54	..	60
Wi.	..	10	50	48	..
Pe.	150	..	59	55	..
Ra.	230	20	81	79	..
Re.	210	10	96	98	..
Du.	90	..	106	107	..

* Figures indicate percentage eliminated in two hours.

† Figures indicate milligrams of total uncoagulable nitrogen per hundred c.c. of blood.

TECHNIC

Each patient was given a sweat bath lasting from twenty to thirty minutes, during which he was made to sweat profusely, and was given at the same time all the water desired by mouth. When the patient was able to be up an electric cabinet bath was employed, but when confined to bed an ordinary vapor bath was used. The blood was taken from a vein at the elbow before and after the bath, 5 c.c. being used for each estimation.

The technic used for the determination of the total incoagulable nitrogen has been that of Folin and Denis, except that we have collected the ammonia in the final stage in fiftieth-normal hydrochloric acid and titrated with fiftieth-normal sodium hydroxid instead of nesslerizing. We have found titration to be as accurate and more simple and less time-consuming than nesslerization for the estimation of total nitrogen. Duplicate analyses were made, except in a few

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

* From the John Herr Musser Department of Research Medicine, University of Pennsylvania.

* These studies were made on patients on the Service of Dr. Alfred Stengel, Hospital of the University of Pennsylvania.

1. Strauss: Ueber Nierenentlastung durch Schwitzen, *Deutsch. med. Wchnschr.*, 1904, xxx, 1082.

2. Bendix, E.: Ueber Wechselbeziehungen zwischen Haut- und Nierenfunktio, *Deutsch. med. Wchnschr.*, 1904, xxx, 233.

3. Georgopoulos, M.: Anregung der Diaphorese bei Niereninsuffizienz, *Deutsch. med. Wchnschr.*, 1908, xxxiv, 372.

4. Von Noorden, C.: *Handb. d. Path. des Stoffwechsels*, 1906, i, 1048.

5. Plaggemeyer, H. W., and Marshall, Jr., E. K.: A Comparison of the Excretory Power of the Skin with that of the Kidney Through a Study of Human Sweat, *Arch. Int. Med.*, January, 1914, p. 159.

6. Loofs, F. O. A.: Welche Mengen von Stickstoff und Kochsalz werden durch die Haut von Nierenkranken ausgeschieden, *Deutsch. Arch. f. klin. Med.*, 1911, ciii, 563.

7. Tachau, P.: Untersuchungen über den Stickstoff- und Kochsalzgehalt des Schweißes von Nierenkranken, *Deutsch. Arch. f. klin. Med.*, 1912, cvii, 305.

instances; the greatest difference permitted being 0.1 c.c. of fiftieth-normal sodium hydroxid. Usually the titrations were identical or varied by only 1/20 c.c. fiftieth-normal sodium hydroxid.

With one exception our cases are all instances of chronic arterial hypertension; in some the phenolsulphonephthalein output was low and there was a moderate or marked increase of the incoagulable nitrogen of the blood; in the others, however, the phenolsulphonephthalein output was normal or nearly so and there was little if any nitrogen retention.

The last case is of especial interest, being an instance of acute mercuric chlorid poisoning with suicidal intent. The patient developed total anuria within twelve hours of the taking of the poison, and this had persisted until the time when our analyses were made, thirty-six hours later. In his vapor bath this patient sweated very freely.

The blood was in all cases taken immediately before the bath, and the second sample in some cases immediately after the bath, in other cases from one to four hours after the bath. Our results are shown in the table and may be summed up in the statement that no change of significance was observed in the concentration of the non-protein nitrogen of the blood as the result of the sweat bath.

In conclusion therefore, without any intention of denying a possible therapeutic value from sweat baths, we find no evidence that they lead to any significant change in the concentration of the non-protein nitrogen of the blood.

THE USE OF ATOPHAN AND RADIUM EMANATION IN THE TREATMENT OF GOUT AND THE ARTHRITIDES*

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Medicine has long awaited a therapeutic agent which would induce a significant increase in the output of uric acid. Before the introduction of atophan, aside from the salicylates, there was no drug which could be relied on to bring about this condition. During the six years of its history, abundant data have accumulated demonstrating that atophan may increase the elimination of endogenous uric acid from 50 to 200 per cent., and the mechanism by which atophan acts has been the object of much investigation. Disregarding the several views held concerning this point, we may say that at present the simplest and most satisfactory explanation is to be sought in an increased permeability of the kidneys, by which the level of uric acid retention is lowered, thus permitting a draining of this substance from the blood and tissues. While there are occasional scattered data in the earlier literature on atophan which appear to favor this view, nevertheless the idea may be said to have received its first experimental support when Folin and Lyman,¹ by

means of the Folin-Macallum colorimetric method, demonstrated an unquestionable decrease in the uric acid concentration of the blood associated with the augmented output in the urine. These observations have since been confirmed by McLester,² Steinitz³ and ourselves.⁴

Whatever may be its cause, gout is undeniably characterized by a concentration of blood uric acid which is from two to five times as great as that observed in normal individuals. Whereas, in the majority of normal individuals one finds 1 to 2.5 mg. uric acid per hundred grams of blood, in gout it is in general as high as 4 to 6 mg. Since the principle of treatment in gout is to avoid purin foods and to maintain the uric acid of the body tissues as low as possible, it would seem that an agent which is essentially a specific eliminant for uric acid, as atophan appears to be, would form a rational therapy in this condition. It then becomes desirable, to learn the details attending the action of this drug.⁵ We have found that the action of atophan on the blood uric acid begins to make itself felt within two or three hours after its administration, that is, as soon as absorption has taken place, and reduces the blood uric acid to a minimum concentration within about two days. This minimum concentration appears to vary for different individuals from 0.7 to 2.5 mg. per hundred grams of blood and cannot be further lowered even when the drug is administered continuously for a month and a half. The original level of uric acid concentration is nearly reattained after the use of the drug has ceased for two days.

Under treatment with atophan, all of the five cases of gout showed improvement of more or less permanence, as did also four cases of possibly gouty nature. Of the eleven cases of arthritis of various types, two showed some improvement. A superficial summary of clinical results of this character cannot, however, convey an adequate view concerning the value of the treatment. Thus, in one case of gout, there was almost immediate improvement after taking atophan, which persisted even after the cessation of the use of the drug, and in spite of the return of the uric acid concentration of the blood to the original level; while in another case of gout, the initial improvement became less pronounced in spite of the continued use of atophan and the maintaining of the blood uric acid at less than half its original level. We shall reserve a more careful analysis of the clinical results until we have had an opportunity to extend our observations over a longer period of time.

In contradistinction to gout, arthritis is not characterized by an excessive concentration of uric acid in the blood; and this difference, in our experience, has been of aid in distinguishing between these conditions. Thus in one case, which by several clinicians was regarded as typical gout, there was a constant uric acid concentration of but 2 mg. per hundred grams of blood. A careful investigation disclosed a colon bacillus infection in the pelvis of the kidney, which was cleared up under the administration of the appropriate vaccine, whereupon all "gouty" symptoms disappeared. We are not yet prepared to assert that a high concentration of uric acid is essential for a

2. McLester, James S.: Studies on Uric Acid of Blood and Urine, with Special Reference to the Influence of Atophan, *Arch. Int. Med.*, December, 1913, p. 739.

3. Steinitz: *Ztschr. f. physiol. Chem.*, 1914, xc, 108; *Deutsch. med. Wehnschr.*, 1914, xl, 953.

4. Fine and Chace: *Proc. Soc. Exper. Biol. and Med.*, 1914, xi, 111.

5. For further details see Fine and Chace: *Jour. Pharm. and Exper. Therap.*, 1914.

* Read before the Section on Practice of Medicine at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. From the Department of Medicine and the Laboratory of Pathological Chemistry, New York Post-Graduate Medical School and Hospital. ... 1. Folin and Lyman: *Jour. Pharm. and Exper. Therap.*, 1913, iv, 537.

diagnosis of gout, but our experience with those cases of joint and muscle involvement associated with a uric acid concentration of less than 2.5 mg. has indicated the desirability of a diligent search for foci of infection in various parts of the body, which may be the primary cause of the joint affections.

The improvement noted in certain cases of arthritis can hardly be explained by an influence on the elimination of uric acid. The usual lowering of the uric acid concentration of the blood is indeed noted, but there is no reason to regard uric acid as a factor in the etiology or progress of arthritis. In such cases there appears to be an analgesic action, which may likewise to some extent account for the relief felt by gouty individuals.

With regard to the influence of radium emanation on uric acid metabolism, various European workers have emphasized essentially two points: the increased elimination in the urine and the reduction or disappearance of uric acid of the blood. The increased elimination of uric acid in the urine under the influence of radium emanation is perhaps due to the induced leukocytosis with subsequent leukolysis. In the light of recent developments in purin metabolism, the disappearance of uric acid from the blood as noted by Gudzent⁶ is a most unusual observation. It has not been supported by beaker experiments or by our own studies.

We have thus far treated thirteen cases of gout and arthritis in an emanatorium with radium emanation of 0.5 to 150 Mache units per liter of air in one- to two-hour sittings for one to two months; two cases of arthritis with radium drinking-water; and five cases of arthritis with injections of radium bromid equivalent to 50 to 100 micrograms of the element. In no instance was there any change whatever in the uric acid concentration of the blood. In view of these findings we can hardly subscribe to Gudzent's claim that with concentrations of radium emanation of as little as 2 to 4 Mache units per liter, uric acid disappeared from the blood and remained absent as long as one year.

With regard to clinical effects, we may say that in only two instances—those in which radium solutions were injected—did there appear to be any improvement. Here again, however, we feel that the treatment should be extended over a greater interval, before conclusions can be properly drawn with regard to clinical results.

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ABSTRACT OF DISCUSSION

DR. CHARLES G. STOCKTON, Buffalo, N. Y.: With reference to the effect of atophan in relieving the uric acid burden of the blood we have given the drug in studies of the blood, including the method of Folin. The drug has acted unpleasantly in some instances, although usually it occasioned no trouble. One other question is what is commonly meant by the term gout. Dr. Chace spoke as though gout was a condition parallel to excess of uric acid in the blood, or uricacidemia. Gout is something in addition to an excess of uric acid in the blood. Just what that something is remains to be seen. In one case coming to my attention the patient had 25 mm. of uric acid in 100 c.c. of blood when not treated, but after long-continued dietetic treatment and the use of atophan he was discharged with 8 mm. of uric acid to 100 c.c. of blood, and yet he had no gout. He had had an attack of gout ten years before. At the same time I had two cases of gout under treatment, one patient having 5 and the other 7 mm.

of uric acid to 100 c.c. of blood; one was treated by atophan and the other by colchicum and both by alkalies; the results were compared. I saw but little difference, save that the atophan seemed to have rather the better effect in reducing the uric acid. The clinical course of the two cases was much alike, both having been severe and typical gout.

DR. S. SOLIS COHEN, Philadelphia: For a number of years I have been making use of atophan and novatophan in the treatment of chronic gout. I agree with Dr. Stockton that uric acid is not by any means the whole story in gout, nor do clinical results always run parallel with the reduction of the uric acid content of the blood whether under the administration of atophan or the use of radium emanations. The most striking effect, clinically, of atophan in gout, rheumatoid arthritis and acute articular rheumatism is the relief of pain. In rheumatic fever the administration of atophan was always accompanied by relief of pain and fall in the temperature, but its withdrawal was followed by a recrudescence of pain and fever. It did not bring about recovery. For this, resort to salicylates was necessary. In cases of chronic gout, or in patients having a distinct gouty tendency, atophan given for one week in the month over a period of several months is helpful. Large doses are not needed, 1 gm. a day (divided into three 5-grain doses) is sufficient. It is not necessary to reduce the uric acid content of the blood to a theoretically normal standard. Gouty people have a higher normal uric acid index than others. It is only when this is exceeded that symptoms result. This is a natural consequence of evolutionary adaptation affecting every cell in the body. While 7 mg. or even 4 mg. per hundred cubic centimeters of blood is excessive for a normal man, it may not be equally excessive for one of gouty heredity. When the quantity of uric acid has been reduced to the equilibrium-point for the individual one should be satisfied; one does not hope to make the gouty cells of an entire body normal. With radium emanations I have had some experience and also with radium drinking-water but I have not sufficient data as yet for positive conclusions. In my dispensary service at Jefferson Hospital my assistants have made careful clinical observations which seem to show that better results can be obtained in the acute cases than in the chronic ones. It is possible that the remedy was not used long enough or strong enough. Our solution equals 50,000 Mache units per liter. The first effect of the radium treatment in cases of painful joints whether of gouty, rheumatic, or other origin, is to increase the pain, that is, providing one gets any effect at all. Unless one gets this exacerbation my observations have been that one cannot hope for a curative result. Apparently the agent acts on a sluggish local process, and reawakens the corrective reactions.

DR. ARTHUR F. CHACE, New York: In reply to Dr. Stockton, we have found that those patients having an intolerance for atophan can take it, well diluted with water, in small doses or in combination with soda. Novatophan has not proved as efficient as atophan. The determination of the uric acid content of the blood will aid in more accurately diagnosing cases of gout. We do not call a case gout unless there is a concentration of uric acid of 4 mg. per hundred cubic centimeters of blood. It is interesting to note in other conditions the high uric acid content of the blood; for example, in uremia we have found a concentration of 14 mg. uric acid to 100 c.c. of blood. The amount of the uric acid content of the blood is an index of the severity of the case. In all clinical cases of gout in which there is a low uric acid concentration it is well to look for a possible focus of infection. With regard to the method of administration, it is wise to do as Dr. Cohen suggested, give the drug for one week in one month, or else alternate giving atophan for four days and allowing an interval of four days. In all cases the patients are placed on a purin-free diet. With purin-free and alcohol-free diet and without the use of drugs we have seen the uric acid content reduced from 6 to 3 mg. per hundred cubic centimeters of blood. With regard to the clinical influence of radium, we prefer to reserve our judgment until we have had an opportunity to extend our observations.

6. Gudzent: Berl. klin. Wchnschr., 1911, xlviii, 2098.

New Instruments and Suggestions

THE SLOANE HOSPITAL INCUBATOR

EDWIN B. CRAGIN, M.D., NEW YORK.

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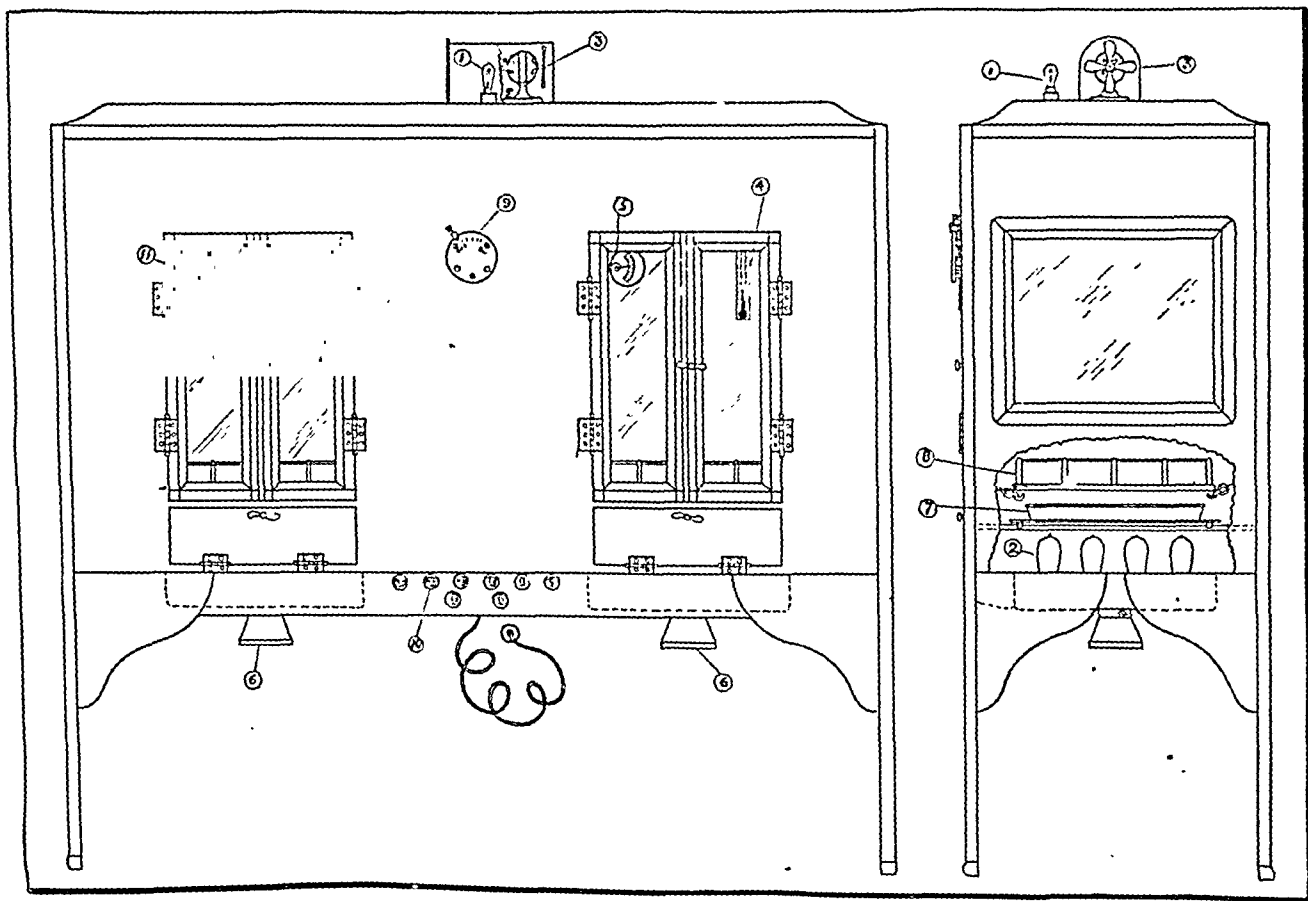
To the different varieties of incubators which have been in use for many years there have been three common objections: insufficient air space; insufficient circulation of air, and difficulty in maintenance of a constant temperature.

Impressed with these objections I have sought to overcome them:

1. By having the incubator built several times larger than those in common use.

2. By maintaining a gentle current of filtered air passing through it. The air enters through a gauze screened opening below and is sucked out by a small electric fan above.

doors of beveled plate glass set in nickel-plated brass frames. At each end is a beveled plate-glass window $24\frac{1}{2}$ inches by $20\frac{1}{2}$ inches. In the interior directly behind each set of doors is a basket or cradle, built of nickel-plated brass wire and supported on hooks, in which the infant lies. Beneath each cradle is a tray which contains water for keeping the air moist. The condition of the air is indicated by a hygrometer and its temperature by a thermometer, both of which are visible through the glass doors. Beneath each tray is a series of violet-colored incandescent lamps which furnish the heat which is distributed by means of a heat disbursor. On the roof of the incubator a small motor with a fan and the necessary resistance is enclosed in a metal chimney leading from the interior. The motor is controlled by a rheostat situated outside of the incubator between the two front windows. The lamps are connected in series of two on each side controlled by snap switches (as shown in the illustration) which in turn are connected with the house current. Directly inside of each door is a small pilot lamp. When the incubator is in operation the air enters through the intakes,



Infant incubator; 1, resistance lamp; 2, heating lamps (violet); 3, motor for exhausting air; 4, thermometer; 5, hygrometer; 6, air intakes; 7, humidity tray; 8, cradle; 9, motor regulator; 10, heating lamp switches; 11, pilot light.

3. By maintaining a constant temperature by different series of electric lights which may be turned on or off in series.

This incubator, which was built for me by the Hospital Supply Company of New York, and of whose hearty cooperation I wish to express my appreciation, has now been in use with two of its fellows at the Sloane Hospital for Women for one year. It has met its requirements well; has demonstrated its superiority over the old types of incubators with small chambers heated by a water tank to which a gas burner was applied, and in the growth and development of the premature babies kept therein has proved a most valuable addition to the hospital.

The mechanical description of the incubator is as follows:

It is built entirely of steel finished on the outside in aluminum bronze and painted on the inside with gray enamel. It consists primarily of the incubator proper which is $84\frac{1}{2}$ inches in length, $46\frac{1}{2}$ inches in height, and $30\frac{1}{2}$ inches in depth. It is supported on legs 30 inches high, making the total height $76\frac{1}{2}$ inches. In front at each side are two double

comes in contact with the heat-disbursing plates and passes throughout the interior. By means of the motor fan a continual gentle current of fresh warm air is kept circulating through the incubator. The degree of heat is regulated by turning on more or less of the snap switches and by proper regulation of the motor.

Feeding Humans According to Formulae.—The study of human nutrition has not yet produced a simple formula for man's guidance in the selection of his food. Such formulae have been successfully used in the feeding of rats, and the skilful stockman in his feeding operations carefully follows charts and rules provided him by experts on animal nutrition. We may expect that similar rules will obtain more and more in human nutrition and there will be, some time in the future, such a thing as scientific feeding of men.—J. H. Lyman, *Popular Science Monthly*.

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SATURDAY, SEPTEMBER 12, 1914

THE NATURAL YELLOW PIGMENTS OCCUR- RING IN THE BODY

"Luteins" or "lipochromes" are names that have long been current to designate the pigment or group of yellow pigments which may lend color to portions of the body rich in fats or to oily secretions derived from the organism. The identification of these yellow coloring-matters has usually depended on their spectroscopic properties. The lipochromes were associated with the fats and lipid substances, not only because of their solubility in these, but also because they showed similar behavior toward fat solvents like ether and insolubility in ordinary menstrua like water. The more or less apparent resemblance of the colors of egg-yolk, the corpus luteum, some blood-serums, sebum, milk-fat, etc., was indicated by the use of a common term, "lipochrome," to cover the pigments of all these animal products. The differences between the so-called lipochromes, represented by slight variations in the solubilities and other properties have become magnified by comparatively recent demonstrations. It has been shown that the pure "lutein" of egg-yolk is isomeric with the crystalline xanthophyll of green plants;¹ whereas the lipochrome of the corpus luteum has been identified as a true carotin.² The difficulties involved in this modern chemistry of the animal pigments will be appreciated from the statement that only 4 gm. of crude crystalline pigment were obtained from 6,000 hen eggs, and less than 0.5 gm. of crystalline carotin from 10,000 cow ovaries.

Following these demonstrations of the nature of some of the animal lipochromes, the origin and physiologic relationships of these natural yellow pigments have been cleared up at the dairy chemistry laboratory of the University of Missouri, in cooperation with the United States Department of Agriculture.³ The fat

of cow's milk owes its natural yellow color to the pigments carotin and xanthophylls — principally carotin, the well-known, wide-spread, yellow vegetable pigments found accompanying chlorophyll in all green plants. The carotin and xanthophylls of milk-fat are not synthesized in the cow's body, but are merely taken up from the food and subsequently secreted in the milk-fat. When a milk-giving cow is fed with food practically free from carotin and xanthophylls, such as the cow usually receives during the winter months, the immediate supply of these pigments in the organism is greatly depleted and may be entirely used up, on account of the constant drain on the supply by the milk glands. The butter-fat accordingly approaches a colorless condition in proportion to the supply of carotin and xanthophylls in the system, the length of time these pigments are kept out of the food, and also very probably in proportion to the amount of milk-fat being produced. If food rich in carotin and xanthophylls is fed to a milk-giving cow whose milk-fat has become practically colorless by reason of the conditions above described, the organism will at once recover its lost pigments and the milk-fat will increase in color in proportion to the amount of carotin and xanthophylls, especially carotin, in the food. Fresh green grass, being probably the richest in carotin of all natural dairy cattle feeds, accordingly produces the highest-colored butter. There is some difference among the different breeds of dairy cows with respect to the maximum color of the milk-fat under equally favorable conditions for the production of a high color. Each breed of cows, however, will undergo the same variation in color of the milk-fat which follows a withdrawal or addition of carotin and xanthophylls, especially carotin, to the food.

The yellow lipochrome of the body-fat, corpus luteum and skin secretions of the cow, like the lipochrome of butter-fat, is composed principally of carotin, which sometimes has associated with it one or more minor xanthophyll constituents. The carotin and xanthophyll pigments of the body-fat are derived from the food of the cow.

In the light of these interesting facts discovered by Palmer and Eckles with regard to the nature of the pigments of milk-fat and body-fat and their simple physiologic relation to the carotin and xanthophylls of the food, it is not surprising to find that the hitherto practically unknown lipochrome of the blood-serum of the cow is also chiefly carotin and bears the same relation to the food as the milk-fat carotin. We are thus able to establish the connecting link between the food carotin and the carotin of the milk-fat, body-fat, corpus luteum, etc., of the cow. Associated in small quantity with the carotin of the serum, probably dissolved in the fat of the blood, are one or more xanthophyll pigments which are always found in more or less variable quantity associated with the carotin of

1. Willstätter, R., and Escher, H. H.: Ueber das Lutein des Hühner-eidotters, *Ztschr. f. physiol. Chem.*, 1911, lxxvi, 214.

2. Escher, H. H.: Ueber den Farbstoff des Corpus luteum, *Ztschr. f. physiol. Chem.*, 1913, lxxxiii, 198.

3. Palmer, L. S., and Eckles, C. H.: Carotin—The Principal Natural Yellow Pigment of Milk-Fat: Its Relations to Plant Carotin and the Carotin of the Body-Fat, Corpus Luteum and Blood-Serum. I. The Chemical and Physiological Relation of the Pigments of Milk-Fat to the Carotin and Xanthophylls of Green Plants. II. The Pigments of the Body-Fat, Corpus Luteum and Skin Secretions of the Cow. III. The Yellow Lipochrome of Blood Serum. IV. The Fate of Carotin and Xanthophylls During Digestion. V. The Pigments of Human Milk-Fat, *Jour. Biol. Chem.*, 1914, xvii, 191.

plants. A variation in the quantity of these pigments in the food results in a corresponding variation in the amount found in the blood-serum and milk-fat. Body-fat formed during this time will also be affected. The government investigators believe that the carotin is carried by the blood-serum in a firm combination with a protein.

The demonstration of the interrelation of food pigments and body lipochromes in cattle applies equally well to man in so far as the available evidence indicates. The fat of human milk may be tinted with the same pigments found in the fat of cow's milk. The relative proportion of carotin and xanthophylls in human milk is much more nearly equal than in the fat of cows' milk. This is not surprising when it is considered that there is strong evidence that the xanthophylls are conveyed through the body dissolved in fat, and when it is also considered that fat plays a much greater part in human food than in the food of the cow. The fat of the human body is often characterized by a marked yellow color. In view of the fact that the pigments of the milk-fat and body-fat of the cow are identical it must therefore be concluded that the pigments of the milk-fat and body-fat of human beings are also identical.

SCHOOL HYGIENE

The study of conditions surrounding school life which may injuriously affect the growth and development of the child, and proper appreciation of the related subject, the hampering influence of physical defects on the intellectual capacity of the young, have until quite recently received little consideration in this country.

The first attempt, probably, to exercise medical supervision of schools in the United States was by the city of Boston, in 1894, for the purpose of controlling the so-called contagious diseases of childhood. From this beginning, the movement has developed until now most of our cities maintain a more or less comprehensive supervision over all matters pertaining to school hygiene and the medical inspection of school-children is mandatory in a number of states and elective in some others.

In this respect we are considerably behind European countries, notably Germany and England, where the system of medical school supervision is more extensively developed, has been longer in operation and is practically national in character. That this is so is largely due to the fact that consideration of the related triad, dirt, destitution and disease, has not been of such immediate importance with us, except in certain restricted areas.

School hygiene is a complex problem. It is generally conceded that our knowledge of its principles is greatly in excess of their practical application. The position of school medical officer presupposes, in addi-

tion to thorough training in physiology and psychology, a practical working knowledge of the physics of heat, light and ventilation, and an ability to recognize and coordinate the physical condition and educational needs of the developing child.

The need of skilled services and the expense incident thereto have been instrumental in restricting the practice of school hygiene largely to urban communities. This is unfortunate, because the great bulk of the school population of this country is as yet scattered over the rural districts.

The disproportionate prevalence of preventable diseases among urban and rural populations is not great; the necessity, therefore, of educating rural communities to the exercise of sanitary precautions necessary for the preservation of health is apparent. The importance of school hygiene in this respect is paramount, because the sanitary redemption of the majority of rural communities must largely be brought about through the practical education of the young in orderliness, cleanliness and the observance of sanitary precautions. Furthermore, the medical inspection of schoolchildren is in more or less intimate relation with the homes, which in turn are component parts of communities. The educational effect of school hygiene extends through these channels for the betterment of the community health.

The necessity for specialized medical services and the rather chaotic tabulation of the results of medical school inspections are largely responsible for deductions that do not bear analytic scrutiny. There is necessity for uniformity in methods of examination and of classifying the results for collective statistics to be of value. To state simply that a certain percentage of so many pupils have "defective teeth" may mean much or little. Certainly there is nothing in this classification to show whether the defect consists of one or more teeth needing attention or the presence of marked deformities. "Enlarged tonsils" do not always mean that the child should suffer the nervous shock attendant on a surgical operation; "diseased tonsils" are another proposition. Defects of vision and spinal curvature are frequently functional in character and due to "habits" of position acquired long before entrance to school, and have no connection with the equipment and arrangement of the classrooms. Much has been done along these lines, but there is need of uniform methods and systematic classification of results before these observations can be of value in studying mental and physical standards, and the effect of changing social conditions on development.

The object of school hygiene is primarily to place the impressionable child in the most favorable environment for physical and mental development and secondarily to detect and correct remediable defects which may impede intellectual training. The medical supervision of schools may, however, be further utilized by

the state in the determination of the prevalence of communicable diseases, especially in rural communities. The ultimate control of malaria, trachoma, tuberculosis and typhoid fever in these communities must be largely through educational methods. For these reasons the combination of the duties of the health officer with that of the medical supervision of schools appears eminently practicable. Furthermore, the health officer would have statutory authority to inspect premises, to abate nuisances and control foci of infection indicated by school medical inspections.

Intensive studies of the mental capacity of American schoolchildren, at varying ages, should be undertaken, in widely separated communities, with a view to the establishment of the normal mental standard, thereby rendering possible the study of the impress of immigration, and the effect of a changed social environment on the mental processes of the immigrant child, as revealed by similar examinations at the ports of entry.

THE VALUE OF HEALTH IN INDUSTRY AND WAR

There is food for reflection in the fact that the exigencies of commerce, the advantageous pursuit of industrial operations, and even the preparation for real or anticipated war may promptly bring about hygienic reforms which wide-spread preaching and earnest exhortation are at best slow in promoting. The "safety first" slogan which one hears in nearly every city of the United States at the present time is one aspect of a movement to increase the personal welfare of the individual by decreasing the liability to injury through the carelessness of a fellowman. The same spirit crops out in the "ten trade commandments" of the worker which are posted conspicuously here and there in factories where personal injuries and loss of life furnish unfortunate and—let it be frankly added—unprofitable incidents in the conduct of manufacturing operations. The reminder "thou shalt not" gains added force when its value is expressed in terms of practice and daily experience rather than in the more vague language of ethical considerations. And accordingly there is a telling force in such direct admonitions as the following, which we quote from a recent compilation for use in a factory:

"Thou shalt take no unnecessary risks, nor try to show off, nor play practical jokes, for by thy carelessness thou mayest do injury which will have effect unto the third and fourth generations to follow.

"Remember thou are not the only one on the job, and that other lives are just as important as thine own.

"Thou shalt not throw matches or greasy waste on the floor, as a dirty worker is a clumsy worker, and a clumsy worker is a menace to his fellow-workers."

These and similar timely suggestions, put in a form that is sure to attract notice, cannot fail to promote

the mutual and reciprocal interest of the employer and the employed. Modern hygiene and preventive medicine have recognized long ago that the individual can no longer claim a liberty in his actions, independent of his neighbor. Our provisions for quarantine, vaccination against small-pox, and diverse other regulations in the interest of the public health have, in the past, been enforced only with the annoyance that comes from lack of cooperation and from personal resentments together with the indifference for restrictive rules that is bred in a community of "free" people. Yet now we see, in the combined enterprise and altruism of modern employers, protective devices put in operation to secure, without friction or resentment, the same sort of welfare results that the federal government or state or municipality would find difficulty in getting under way.

That the unexpected situations created by war have, in the past, furnished the stimulus for new inventions and useful processes is too well known to require detailed comment. It would appear in the present situation that the war against universal peace may actually be a war against intemperance. The armies and navies of to-day represent the most efficient fighting forces that the nations can command. No device, no agency that will contribute to their power and preparedness, is willingly neglected. Health is a prime consideration in this respect. Field Marshal Earl Kitchener is reported to have counseled the English soldiers to abstain from drinking while abroad, reminding them that their duty cannot be done unless health is preserved. The men were cautioned to keep constantly on guard against excesses. The German Emperor is said to have forbidden the "treating" of the soldiers in his armies. The sale of absinthe, imported by French soldiers in an earlier war, when alcohol was used to fight fever, has been restricted in Paris.

It is of slight consequence whether or not these rumors are entirely correct. They represent the current tendencies, which are undeniable by anyone who has watched the recent decisions of American naval authorities in the face of not a little apparently adverse criticism couched in the usual phrases concerning personal liberty. The truth is, that "the relation of alcohol and fighting has been squarely met, and the fact admitted that they are not compatible." A recent editorial writer has expressed this by saying that a temperate army was something not conceived of in the old theories of war; but a drunkard is to-day as much out of place in an army as he would be on a battleship. As every great conflict, whether of church or state, of labor or commerce, has brought out some permanent good, however clouded it may temporarily have been by the major issues at stake, so the horrible strife which the world is now experiencing may actually be developing a war against intemperance—a permanent advantage of no mean proportions.

A NATIONAL STANDARD REQUIREMENT
FOR MEDICAL PRACTICE

The varying standards of medical practice in the several states have caused inconvenience and hardship from the time the states began to protect their citizens against incompetence and fraud. Complaint has frequently been made against the injustice inflicted on physicians who, after years of successful practice in one state, are obliged, before being permitted to practice in another, to submit to examinations on the same terms as if they were recent graduates. In one instance, at least, an eminent man with a national reputation was called on, when moving to another state, to undergo a written test of his ability and to remember text-book words, this test being administered, it was inferred, by one of his own former pupils.

Unlimited interstate reciprocity, on the other hand, is impracticable so long as the various states maintain differing standards for medical registration. A state which maintains a high standard obviously cannot be expected to reciprocate with a state which is satisfied with a low standard. Although the Constitution does not place the regulation of the practice of medicine among the functions of the federal government, nevertheless, it must be borne in mind that the Constitution does not prohibit the national government from assuming such a function should it be deemed desirable. The Constitution does not prohibit the establishing of a national standard or the making of such a standard obligatory. In practice, however, the national government has thus far left the control of these matters to the individual states. Not only is there no constitutional obstacle to the establishment by the general government of a standard for medical practice, and the provision of an examination, recognition of which shall at least be optional with the states, but, on the other hand, there are many strong reasons for such action.

Twelve years ago *THE JOURNAL* suggested¹ that all examinations for entrance into the various government medical services, instead of being given severally by the respective services, be given by one national board of examiners empowered to grant certificates or diplomas which should be a guarantee of a thorough and practical medical education and a prerequisite for candidacy for any medical position under the government. "The examinations should in part be conducted in hospitals and laboratories, so that practical and not theoretical knowledge would be demanded." The standard established should be such that, although its recognition as a credential for license by the state boards would be optional with the states, no state would have an excuse for refusing to recognize it. In fact, the practice acts of at least five states, Alabama, California, Colorado, Illinois and North Dakota,

provide that the licensing boards may license without examination physicians who have passed the examinations and served as officers of the United States Army, Navy or Public Health Service. The routine is practically the same in such cases as in carrying out the idea of reciprocity, so called. In either case there must be a voluntary relinquishment of rights on the part of the state, and the state can only give its examining or licensing boards the privilege of accepting the credentials of a corresponding board of another state.

The idea was taken up by Dr. W. L. Rodman² before the Committee on National Legislation of the American Medical Association later in 1902. He argued that the states would no doubt be glad to recognize diplomas or certificates issued, after a rigid, broad and practical examination by a board of unassailable standing. This would not interfere with the work of the state examining boards, for only the exceptionally able and ambitious graduate would care to try for the national diploma.

Lieut.-Col. J. R. Kean,³ in a recent address before the Federation of State Medical Boards, makes a practical suggestion toward the establishment of such a national examining board. The Secretary of War, he reminds us, is authorized to issue commissions as first lieutenants in the Medical Reserve Corps to graduates of reputable medical schools who pass an examination to be prescribed by the Secretary. No limit is placed on the number of reserve officers.

If, therefore, the President of the United States should appoint a board for the examination of officers for the Medical Reserve Corps, of a composition which would insure a high standard of requirement, and the state boards would agree to recognize without examination the holders of Reserve Corps commissions—as the states named above already recognize medical officers of the government services—the thing would be accomplished. If the laws of any state do not at present permit such recognition it would not be difficult to obtain the necessary legislation.

It would not be necessary to wait for favorable action by every state, for if the scheme were to be begun by even a few states, the rest could be expected to come into line as the desirability of the scheme became evident. It would obviously be desirable that the other medical services of the national government should join with the United States Army in a plan of such importance to the profession at large. The successful candidate would then have the qualification for a commission in the Medical Department of the Army, the Navy, or the Public Health Service, as well as a certificate of proficiency, "which would be the open sesame to the doors of state exclusiveness." As Kean

2. Rodman, W. L.: A Voluntary Board of National Examiners, *THE JOURNAL A. M. A.*, May 10, 1902, p. 1215, also editorial same issue, p. 1233.

3. Kean, J. R.: The Use of the Government Medical Services in Raising the Standard of Medical Education, *Quart. Fed. State Med. Boards U. S.*, April, 1914.

1. National Board of Medical Examiners, editorial, *THE JOURNAL A. M. A.*, Jan. 11, 1902, p. 108.

says, "this board would not seek to examine a very large proportion of the recruits to the ranks of the profession or supersede, in any way, the state boards. . . . It is to do what a group of boards cannot do: to set a standard which all will accept; to be a mint which will stamp with its approval the good coin so that it will pass current in every part of the country, and not have to be weighed at every state line; to break down the barriers which, for acknowledged competence and ability, are unnecessary, vexatious and barbarous. It would be for the pace-makers and standard-makers of each year's crop of graduates; for the men who desire special honors or appointments; or for those who have migratory instincts and who may desire to enter some new field of work, and for whom the seal of approval of the general board would be valuable."

It may be of interest in this connection to note that Canada, which was confronted by a similar problem in the form of provincial rights that might not be gainsaid by the federal government, has surmounted the difficulty by the creation of a general medical council, whose registration the provinces had the privilege of accepting after the passage of permissive legislation. It is surely not to be imagined that so unfortunate an anomaly as our present chaotic system of registration is to remain an insoluble problem.

THE ALIMENTARY BACTERIA OF HEALTHY CHILDREN

The profound significance of the bacteria of the alimentary tract during the period of infancy is appreciated in a general way by every one who is concerned with the nutrition of children. It is nevertheless quite doubtful whether all of the manifold possible relations of the intestinal flora to the problems of health and disease are ordinarily comprehended by those who do not give considerable attention to the subject. Micro-organisms can, of course, injure the individual by becoming the agents of infection. Pathogenic bacteria find their way through the alimentary barrier and may bring about digestive or other nutritive disturbance as a secondary consequence of some systemic disease for which they are responsible. Far more commonly, however, the bacterial invaders initiate harm by their immediate, local action on the food materials which they meet in the gastro-intestinal canal. It is in this respect that our knowledge of the situation is still far from complete.

Broadly speaking, we realize that proteins, fats, and carbohydrates are altered in specific ways through the agency of bacteria. The limited character of this information is exemplified by the use of the indefinite expressions, such as the "putrefaction," "growing rancid," or "fermentation" respectively of the three great groups of nutrients. In a way, furthermore, it

is realized that the fermentative activities tend to preponderate over the putrefaction changes in infants when the diet is a natural one of milk. But there is nothing in such generalizations that is definite or specific enough to furnish very helpful guidance in times of alimentary trouble. The formation of abnormal products is never the result of the chemical processes of uncomplicated digestion. The harmful compounds arise only through the intervention of bacteria; the latter may belong to a specifically abnormal flora, or the normal alimentary flora may for some reason overstep the usual bounds of its activity and thus become abnormal in behavior rather than in its microbial character. Finally, ordinarily harmless organisms may completely change the nature of the products to which they usually give rise, if the character of the substratum that they subsist on is radically altered or other features of their environment become different. The intestinal flora of infants and young children therefore unquestionably deserves further study to determine more specifically than ever before the range of variety possible and the nature of the products which may be held responsible for physiologic effects of bacterial origin.

First of all and preliminary to a study of the morbid changes, it seems necessary to expand our knowledge of the conditions in health. A contribution has recently been furnished by Logan¹ from the research laboratory of the Royal College of Physicians at Edinburgh. His investigations agree in many respects with previous findings, notably the well-known experiments of Tissier.² In the intestinal flora of breast-fed infants—the ideal condition—the acid-tolerant group of organisms is immeasurably predominant, and is of the strictly anaerobic type called *Bacillus bifidus*. Coccal forms and lactose-fermenting bacilli are present, but scanty; spore-bearers are rare. In artificially fed infants the main difference is a decrease of the acid-tolerant group, and an increase in the lactose-fermenting group, along with the appearance of the non-lactose-fermenting organisms. The place of the *Bacillus bifidus* is now largely taken by the facultatively aerobic *Bacillus acidophilus*. The coccal forms show greater variety under this condition of diet. In children on both the breast and the bottle, a half-way stage between the two types of flora is observed. When children were fed a diet approximating more or less in type to that of adults, no one variety of organisms dominated the others as it does in the breast-fed individuals. The number of varieties present was greater. Coccal forms were numerous and very varied in type. The spore-bearing *Bacillus enteritidis sporogenes* was isolated in some cases.

These statistics emphasize very clearly the readiness with which the alimentary flora changes as the result

1. Logan, W. R.: The Intestinal Flora of Infants and Young Children, Jour. Path. and Bacteriol., 1914, xviii, 527.
2. Tissier: Compt. rend. Soc. de biol., 1899, li, 943; Ann. de l'Inst. Pasteur. 1905. xix. 109.

of relatively slight changes of diet (with its variable content of bacteria). If the simpler conditions of microbial life found in the breast-fed infant represent a great physiologic advantage, future efforts should be directed to learn how to prolong them even when the dietary regimen is necessarily altered.

Current Comment

KNOWN BY THE COMPANY IT KEEPS

The advertising manager of a certain cement company doing a national advertising business holds that, in spending his employer's advertising appropriation, it is his duty to demand of the publications he patronizes value received for the money paid. He feels that he does not get the true value when advertisements of his product are lined up with advertisements of fraudulent wares. To the advertising agencies he says:

"Will you please say to all newspapers desiring to carry our advertising that we decidedly object to being placed in close company with noisome patent-medicine ads and other fakes or near-fakes . . ."

To explain what he means, at greater length, the manager in an open letter to the Association of National Advertising Managers recalls a recent experience. Picking up a New York daily a few weeks ago, he found an advertisement unblushingly claiming that a certain "patent medicine" would cure consumption. He wrote, protesting, to the publishers of the paper who, in return, defended the advertisement and said they would continue to carry it. Commenting further on the atrocity of the claims made by the exploiter of the nostrum, the advertising manager says:

"Either this advertising doctor has a cure for consumption or he hasn't. If he is the great benefactor for which suffering humanity has looked in vain for generations, this newspaper would have a scoop and would at once give pages of free publicity. If it really believes what it aids this advertiser to say to consumptives, its editorial department is asleep at the switch."

This criticism will hold true of most "patent-medicine" advertisements. Wide-awake men in the advertising business realize that every dishonest advertisement weakens the opportunity of decent advertisers to gain the confidence of readers. Enlightened selfishness alone should impel the advertisers of meritorious and truthfully-exploited products to protest against being placed in company with swindling "patent medicine" fakers. The advertising manager just mentioned says: "Robbing consumptives or opening the door for such robbers seems to me to be business in which no decent man can engage." He might have added that the majority of schemes devoted to robbing consumptives and other sick persons would cease to exist were it not for the publicity which certain publications are willing to give them—for a consideration. The arguments and criticisms just given, while applying specifically to lay publications are applicable with equal force to medical publications. The medical profession has for years been pleading for the suppression of fraudulent advertising that directly affects the public health; at the same time our profession has tolerated and supported

medical publications whose advertising pages have been, and in many cases still are, reeking with frauds just as vicious as those to be found in newspapers that cater to quacks and "patent-medicine" fakers. The only difference between a fraudulent "proprietary" and a fraudulent "patent medicine" is in the language used in advertising the two products. A lie is no less a lie because it is told in dignified language, and a fraud is no less fraudulent because it is perpetrated on the public through the instrumentality of physicians. What the advertising manager of the cement company said with regard to advertisements in newspapers and general publications applies with equal force to advertisements in medical journals:

"Gentlemen, the time for pious prating about truth in advertising is past. The public will soon give us the laugh of scorn if we solemnly talk about truth while hundreds of mediums are brazenly sharing in the spoils of dishonorable advertising."

THE SALUTARY EFFECTS OF MUSIC

To what are the beneficent effects of music due? Darwin, who never rested until he could explain a thing, if it were explainable, could nevertheless not more explain why musical tones in a certain order and rhythm afford pleasure, than we can account for the pleasantness of certain odors and tastes. "We know that sounds, more or less melodious, are produced, during the season of courtship by many insects spiders, fishes, amphibians and birds." After all, we need go no deeper for an adequate explanation than that influences, such as music, which are agreeable, are therefore salutary, and music is agreeable because its component tones are regular, periodic vibrations, even auditory waves precisely so many to each note, being in this regard unlike noises, which are irregular, dissonant, conflicting vibrations. Sound waves impinge on the hearing sense, whence the perception is conveyed to the brain. The benignant influence of music physically is by the transmission of its influence from the cerebrum through the sympathetic system, which directs the various organs. Thus not only is music physic for the soul, dissipating mental depression, soothing psychic perturbations; but its influence may also enhance nutrition, further digestion (as by the "liver music" of the French) and restore organic equilibrium. Indeed, the entire working of the human mechanism, physical and mental alike, may be lubricated by a stream of music, which art and science should therefore have a place in the medical armamentarium. It would no doubt be too much to expect every physician to be a performer on some instrument; yet illustrious colleagues have been skilled executants. Strümpell, for example, was an excellent violinist; Billroth was a superb player on the piano, and all the better surgeon for his graceful skill on that instrument. And who among "those present" could forget how in Boston several years ago, during the reception of the American Medical Association, the glee club made up of local physicians burst forth into concerted song, to the supreme delight of their hearers? There is agitation now in behalf of music as adjuvant to anesthesia; to this end some musical

skill might be required of medical fledglings in examinations for junior internships. In any event every physician could well be at least an appreciator of music and have some understanding of that most ingratiating art.

THE ABSORPTION OF WOOD ALCOHOL THROUGH THE LUNGS

The increasing use of wood alcohol in the industries and the growing appreciation of the toxicity of the substance, involving possibilities of harm far greater than the behavior of the closely related grain spirits, ethyl alcohol, would lead one to suspect, have given the impetus to extensive physiologic investigations. To some of these, notably the experiments of Völtz and Dietrich, we have referred in the past.¹ Usually the study of the effects of methyl alcohol has been confined to conditions in which it has been introduced into the organism by way of the stomach. In some of the industries, particularly those in which denatured alcohol containing the methylated spirits are employed, the possibility of absorption of vapors of wood alcohol through the respiratory passages and lungs must be reckoned with. A very recent investigation with this point in view, by Loewy and von der Heide at the Royal Agricultural College in Berlin,² has disclosed the surprising fact that quantities of methyl alcohol as small as 0.2 per cent. in the inspired air may lead to absorption of the product into the body in not inconsiderable amounts. The absorption is slow, so that some time may elapse before the organism is "saturated" with the alcohol. Somewhat unexpected is the fact that, under comparable conditions, fat animals take up decidedly less wood alcohol exhibited as vapor admixed with air than do lean subjects. This is due to the poor solubility of methyl alcohol in fats and lipoids, a fact demonstrated by the German investigators contrary to the current beliefs of the relatively ready solubility of the lower alcohols in fats and fat-like substances.

RED AND WHITE MEAT

The irritating action of the extractives of meat during excretion by the kidneys is well known and has been the basis of a rule of treatment limiting the use of these products and the meats containing them to a minimum in the treatment of parenchymatous and interstitial nephritis. Because certain red meats contained a large amount of extractives, the rule to exclude red meats and permit white meats and fish gained currency. More recently it has been shown that some white meats contain a high percentage of extractives, so that the chemical composition of the two varieties of meat does not differ sufficiently to justify a marked preference for the white meat over the red. On the other hand, there are those who still assert that the objection to red meats as opposed to white is well founded. Thus McCrae in Osler's

"Modern Medicine"¹ says "All kinds of meats contain extractives, and the so-called dark meats to a greater extent than the light meats. Adler," McCrae says, "in a review of the subject, concludes that the prevalent idea that the subject of renal disease ought to eat light rather than dark meats is correct, and that these meats boiled contain the harmful factors less than when roasted." The fact is that the color is an insufficient criterion. The objection to extractives as irritating to the kidneys is quite correct and the important point is to determine for each kind of meat whether it contains a sufficient amount of the extractives to be injurious. The question thus seems to be reopened. Kindborg,² in the chapter of his text-book dealing with this subject, concludes that the old distinction between red and white meats cannot be sustained. He finds his recommendations for the use of meat in nephritis on the comparative amount of extractives in the individual sorts of animal food. Thus some sorts of fish are higher in extractives than most kinds of meat and their effect on the kidneys must be judged accordingly.

Medical News

ARKANSAS

Personal.—Dr. Walter K. Grey has been appointed local surgeon for the Iron Mountain System at Cotter.—Dr. William C. Tipton, Mountain Home, has been appointed physician in charge of the Confederate Soldiers' Home, Little Rock.

Home from Abroad.—Dr. and Mrs. James H. Buckley, Fort Smith, returned from Europe, August 12.—Dr. Ollie W. Clark, Pine Bluff, reached home from abroad, August 20.—Dr. R. Manton Wilson, Hope, who has been in Korea for eight years as a medical missionary, has returned home.

ILLINOIS

Personal.—Dr. Albert F. Storke, for five years president of the Board of Health of Oak Park, has resigned.—Dr. Clara Harrison Towne, Lincoln, has resigned as psychologist at the Lincoln State School and Colony.

Home from Abroad.—Dr. and Mrs. Robert S. Denney, Aurora; Dr. and Mrs. Karl F. Snyder, Freeport; Dr. Nina P. Merritt, Alton; Dr. Frederick E. Roberg, Joliet; Dr. George B. Kelso, Bloomington, and Dr. Ora L. Pelton and family, Elgin, have returned from abroad.

Chicago

Changes Field of Labor.—Dr. Thomas H. Glenn, formerly in charge of the pathologic and bacteriologic laboratories of the Northwestern University, has been placed in charge of the clinical and Roentgen-ray laboratories now being installed in the First National Bank Building, Fort Dodge.

Abroad and Home from Abroad.—Dr. Carl Langer and family and Dr. and Mrs. Bradford A. Camfield have returned from abroad.—Dr. and Mrs. Zenas H. Going are reported to be in London.—Dr. Anthony Biankini, Dr. Walter K. Allport, Dr. and Mrs. Alfred Schirmer and Dr. Hayden S. Barnard and family are still in Europe.

INDIANA

Reappointments on State Board.—The governor has reappointed Drs. Moses S. Canfield, Frankfort, and W. A. Spurgeon, Muncie, as members of the State Board of Medical Registration and Examination.

Indiana Physicians Returned and Abroad.—Dr. Malachi R. Combs, Terre Haute, has landed in New York.—Dr. and Mrs. Charles O. Bechtol, Marion, have reached home from Germany.—Dr. Manford M. Clapper, Hartford City, who had been marooned in London, has reached home.—Dr. and Mrs. Edward F. Hodges, Indianapolis, are said to be in London.

1. Völtz, W., and Dietrich, W.: Ueber die Beteiligung des Methylalkohols und des Aethylalkohols am gesamten Stoffumsatz im tierischen Organismus, *Biochem. Ztschr.*, 1912, xl, 15; Some Public Aspects of the Wood-Alcohol Industry, editorial, *THE JOURNAL A. M. A.*, Feb. 14, 1914, p. 538.

2. Loewy, A., and von der Heide, R.: Ueber die Aufnahme des Methylalkohols durch die Atmung, *Biochem. Ztschr.*, 1914, lxxv, 230.

1. Osler: McCrae in *Modern Medicine*, Ed. 2, iii, 784.
2. Kindborg, E.: *Innere Medizin*, iii, 90.

KENTUCKY

Personal.—Dr. B. Frank Eckman, Covington, has returned from Europe.—Dr. and Mrs. Frank T. Fort, Louisville, have returned from abroad.—Dr. W. Edward Grant, health officer of Louisville, who has been ill for four months, is convalescent and has resumed practice.

MARYLAND

Abroad.—Dr. H. Flournoy, resident psychiatrist at the Henry Phipps Psychiatric Clinic of Johns Hopkins Hospital, and a member of the medical reserves of the Swiss army, has left Baltimore to return to Switzerland, in answer to his country's call for reservists.—Dr. Ernest Zuehlín, who is in Germany, has not been heard from and it is thought that he will remain in his country and assist in the army or in some hospital that will be established for the wounded.

Personal.—Dr. Robert F. Wells, Gamber, is ill with typhoid fever in St. Anthony's Hospital, Baltimore.—Dr. Charles R. Edwards, Baltimore, who was operated on for appendicitis, has recovered and resumed his practice in the University Hospital.—Dr. Thomas Boyle Owings is said to be critically ill at his home, Owings Glenn, Ellicott City.—Dr. Francis E. Harrington, Cumberland, has been appointed assistant epidemiologist in connection with the United States Public Health Service, Washington.

Home from Abroad.—Dr. Charles E. Hartwig of Baltimore who arrived on the refugee ship *Princesa Mafalda* from Europe tells of his capture by the Austrians as a spy. He was searched and questioned and turned over to the police of Vigi di Fassa. Eventually he proved his American citizenship and was released.—Physicians who have returned from Europe are Dr. Joseph Bloodgood, Dr. Frank Martin, Dr. Randolph Winslow and Dr. Frederick Baetjer; Dr. James T. Johnson, Cumberland; Dr. and Mrs. Alexander D. McConachie and Dr. Mary N. Browne, Baltimore.

MISSISSIPPI

Personal.—Dr. Edward C. Parker, Gulfport, has returned from abroad.—Dr. Thomas O. Hunter, Biloxi, registrar of the statistical department of the State Board of Health, is said to have been removed by Dr. Ethelbert H. Galloway, Jackson, secretary and executive of the board.

Progress of Hookworm Campaign.—The work in Jones County was brought to a very successful conclusion toward the end of August, over 2,500 cases having been treated. Hookworm was found in over 60 per cent. of all cases examined, the largest percentage being found in children. The people showed much interest and cooperated in the work. Many schools were found in which all the teachers and pupils were infected. Much infection in country schools is attributed to the ingestion of the eggs of the parasites in drinking-water obtained from springs near the schools.

MISSOURI

New Sanatorium.—Dr. W. S. Woodford, West Plains, has leased the Havens property in Carthage which was formerly used by Dr. Fulton as a sanatorium and will equip it and operate it as Woodford's Sanitarium. The institution will be opened some time next month.

Poison Selling Restricted.—An ordinance has been adopted by the city council of Joplin, placing restriction on the sale of morphin, cocaine, heroin, carbolic acid and other poisons and also on the extracts and derivatives of habit-forming drugs. The ordinance also prohibits the distribution of sample packages or bottles of medicine.

Missourians Abroad.—Dr. and Mrs. Charles C. Dennie and Dr. and Mrs. Edward G. Blair, Kansas City; Dr. William F. Schmid, St. Joseph, and Dr. and Mrs. John J. Bourn, Hannibal, have returned from abroad.—Dr. Andrew L. Shog, Kansas City, is said to have been placed in charge of the Salpêtrière Hospital, Paris.—Dr. James W. Heddens and family, St. Joseph, are in Stratford-on-Avon, England.—Dr. J. Elliott Royer, Kansas City, is in a hospital in Bern, Switzerland, recovering from injuries received in a fall while mountain climbing.

St. Louis

Personal.—Dr. Wilhelmina A. Ragland is interned in Switzerland.—Drs. Christopher C. Morris and Walter R. Hewitt have returned from abroad.

Banquet to Hospital Board.—Hospital commissioner, Dr. Cleveland H. Shutt, and the hospital superintendents gave

a dinner in honor of the members of the hospital board, August 29.

Leper Escapes from Colony.—George Rusuls, a Greek, who has been under the observation of the health authorities for leprosy and was sent to join the leper colony at Quarantine, August 29, escaped a few hours later.

Hospital Opened.—The three-story building at Grand Avenue and Palm Street, recently purchased for \$30,000 by the board of benevolence of the Christian Church, which has undergone extensive alterations and decorations, will be opened in a short time as the Christian Hospital. The institution has a capacity of fifty beds, and the officers of the staff are, Dr. Julius C. Heinrichs, president; Dr. Albert E. Meisenbach, vice-president, and Dr. Treston R. Ayars, secretary-treasurer.

MONTANA

Personal.—Dr. Fred F. Attix, Lewistown, has returned from abroad.—Dr. Robert I. Rizer and family, Anaconda, believed to be in Vienna.—Dr. Charles R. Blake, Butte, and Harry A. Bond, Dillon, have entered into partnership.

Prosecution of Milk Dealers.—The first prosecution of milk dealers in Cascade County was conducted July 17, at Great Falls, when the proprietors of five local eating houses were tried in the justice court for selling milk containing less than the standard percentage of butter fat. Three of the restaurant proprietors were tried and found guilty, and two pleaded guilty without the cases coming to trial.

NEW YORK

Personal.—Dr. Baxter T. Smelzer, Albany, has returned from abroad.—Drs. Thomas A. Ryan and Edward G. Griffin have been appointed examining physicians for the Albany District by the State Compensation Commission.

Wants Psychopathic Ward.—In a report made to the health commissioner of Buffalo by Dr. Baron Ross Nairn, examiner in lunacy, an appeal is made for a better psychopathic ward for the care of Buffalo patients under observation for supposed lunacy.

Children's Haven Opened.—On August 29 the Children's Haven at Far Rockaway was formally opened by Health Commissioner Goldwater. This home has accommodations for thirty-five and will care for children whose widowed mothers are in hospitals.

New York City

Personal.—Drs. John W. Draper, William J. Robinson and wife and George W. Jean have returned from abroad.—Dr. Lewis S. Pilcher, Brooklyn, has been elected surgeon-general of the Grand Army of the Republic.—Dr. Moses S. Kakels, Dr. Sara Welt-Kakels, Dr. John Warren and Dr. M. E. Rhein have returned from Europe.

NORTH CAROLINA

Home from Europe.—Drs. Lucius N. Glenn, Gastonia and Jacob F. Highsmith and daughter, Fayetteville, have returned from abroad.

Field Hospital Encamped.—Field Hospital, No. 1, N. C. N. G., encamped the last week in August at Camp Battle near Hendersonville. More than one hundred members were present.

Antityphoid Vaccination.—The North Carolina State Board of Health is now furnishing antityphoid vaccine, and in Robinson County alone more than 2,800 inoculations have been made.

Health Seekers Society Chartered.—The Asheville Health Seekers Society has been incorporated without capital by D. A. Pressley, W. P. Harvey and James Williams, with the object of providing friendly attention for worthy tuberculosis patients, funds for their needs and a sanatorium for the care of patients with small means and those who are indigent.

Personal.—Dr. J. Vance McGougan, Fayetteville, gave his annual entertainment to the Cumberland and Hoke Counties Medical Society, August 20, at his country place.—Dr. James M. Covington, Wadesboro, has been added to the state hookworm commission.—Dr. Samuel W. Hurdle, Reidsville, has been appointed whole-time health officer of Rockingham County, vice Dr. Samuel Ellington, Wentworth, resigned.

OKLAHOMA

Personal.—Dr. Charles R. Preston, Mountain Park, lost his office furnishings by fire, recently.—Dr. George W.

Sutton, Cleveland, has purchased the Bartlesville Hospital and has remodeled it and increased its capacity to twenty-five beds.—Dr. Alva A. West, Guthrie, will remain in England during September.

The Tables Turned.—Dr. G. Fowler Border, Mangum, was recently made the object of an unusual attack. It is alleged that an attempt was made by two women to induce him to perform a criminal operation, a dictograph having been placed in the room before the conference. Dr. Border, instead of being trapped, trapped the trappers. Two arrests have been made and Dr. Border is said to have filed suit for \$100,000 against the Burns Detective Agency, Chicago.

PENNSYLVANIA

Personal.—Dr. Henry J. Benz has succeeded Dr. Henry B. Burns as superintendent of the Bureau of Child Welfare of Pittsburgh.

Physicians Entertained.—The Carbon County Medical Society was entertained by Dr. John W. Luther, Palmerton, at a clam bake and cornroast recently, at Lake Mineola near Brodheadsville.

Home from Europe.—Dr. Martin E. Griffith, Monessen; Dr. and Mrs. George B. Kunkel and son, Harrisburg, and Dr. Charles H. Schlesman and son, Allentown, have returned from Europe.—Dr. Tyrus E. Swan, Easton, has reached London on his return home.

Bulletin on Health of Schoolchildren.—Dr. Samuel G. Dixon, state health commissioner, issued his thirty-first *Weekly Bulletin*, August 30. It deals with the health of schoolchildren and the care and attention which should be paid to them before entering the school that much illness from contagious diseases may be prevented.

Philadelphia

Personal.—Dr. Charles B. Penrose arrived from Europe September 3.—Dr. Howard F. Hansell arrived in New York September 2.—Dr. James William White is taking a trip through the Puget Sound Country and British Colony.—Dr. Walter L. Pyle has returned after a trip to Demerara, British Guiana.—Dr. Karl Schaeffle has succeeded Dr. Edward B. Shellenberger, Harrisburg, as deputy medical inspector of tuberculosis dispensaries.

Million Assured for Blockley.—It has been announced that Councils' Finance Committee will yield to the demand of the physicians that the next loan shall include \$1,000,000 to start the reconstruction of the Philadelphia General Hospital. While the overcrowding has been relieved to considerable extent by the removal to Norristown of many of the insane and indigent patients, and by other arrangements, there is still insufficient room at Blockley and, what is worse, it is impossible to give modern treatment in accordance with advanced ideas of sanitation in the present old buildings.

Rat Receiving Station.—On September 4, a rat receiving station was installed at the Race Street Pier and the payment of bounties for live and dead rats began. William J. Wahl, an inspector of the Board of Health, is in charge of the station, which is open from 8 a. m. to 5 p. m. and is connected by telephone with the electrical bureau. Thirty rats taken from the liner *Merion* which docked from Liverpool, have been taken to the city laboratories to be examined for traces of bubonic plague. Rats are being taken from the holds of all vessels docking at this port, as a part of the campaign instituted by Director Harte of the department of health and charities. A corps of nearly a score of special agents is inspecting vessels as they arrive, and also is collecting rats from several hundred traps placed along the Delaware River front between Girard Avenue and Reed Street. It is hoped in this way to keep out the bubonic plague.

TENNESSEE

Hookworm in James County.—Dr. Yancey, state hookworm examiner, after an investigation in James County, declared it heavily infected with hookworm. Of about 100 children examined, 75 were found infected.

From, to and in Europe.—Drs. Herbert T. Brooks and Otis S. Warr, Memphis; Drs. George Manning Ellis, Edwin Dunbar Newell, German P. Haymore, Henry Berlin, James H. Atlee, James A. Smith and John S. B. Woolford, Chattanooga; Drs. Albert G. Kern, Knoxville, and Albert W. Harris, Nashville, have returned from Europe.—Drs. Cary Snoddy and Robert H. Newman, Knoxville, sailed on the

hospital ship, *The Red Cross*, September 9.—Dr. Hiram B. Jacobsohn has reached Rotterdam from Vienna on his way home.

TEXAS

South Texas Physicians to Meet.—The annual meeting of the South Texas Medical Society will be held in Corpus Christi, September 15 and 16, under the presidency of Dr. F. W. Painter.

Health Exhibit Car.—The appropriation of \$10,000 made by the thirty-third legislature is sufficient to equip and maintain a health exhibit car which will start on its journal over the state this month. The car will be accompanied by a director and a corps of lecturers and demonstrators.

Physicians Abroad.—Drs. Edward H. Cary and Garfield M. Hackler, Dallas; Otto K. Peters, Galveston; Samuel P. Cunningham, San Antonio, and Joseph Gilbert, Austin, have returned from abroad.—Dr. James W. Ward, Detroit, is believed to be in Vienna.—Dr. and Mrs. Harold L. Warwick, Fort Worth, are in London.

Personal.—Dr. Edmond Doak, heretofore associated with the Taylor Sanitarium, has purchased a third interest in the Taylor City Hospital.—The Whiteside Office Building, owned by Drs. E. F. and M. A. Whiteside, Timpson, was burned August 6, with a loss to Drs. Whiteside of \$2,000 in office books and instruments, and of \$1,500 to Dr. Ollie F. Johnson.

GENERAL

Colored Physicians Meet.—The National Medical Association held its annual meeting in Raleigh, N. C., August 25 to 27 and elected the following officers: president, Dr. Frank S. Hargrave, Wilson, N. C.; vice-presidents, R. C. Brown, D.D.S., Richmond, Va., and W. A. Jones, Ph.G.; secretary, Dr. Walter G. Alexander, Orange, N. J.; assistant secretary, Dr. G. R. Ferguson, Charleston, S. C.; treasurer, Dr. J. R. Levy, Florence, S. C. It was decided to meet in Chicago in 1915.

Hospital Chiefs Confer.—At the sixteenth annual meeting of the American Hospital Association held in St. Paul, August 24 to 28, the followings officers were elected: president, Dr. William O. Mann, Boston, superintendent of the Boston Homeopathic Hospital; vice-president, Dr. Arthur B. Ancker, superintendent of the St. Paul City Hospital; W. W. Kenney, superintendent of the Victoria General Hospital, Halifax, N. C., and Miss Ida N. Barrett, superintendent of the Grand Rapids (Mich.) Hospital; secretary, Dr. Harry A. Boyce, superintendent of Kingston General Hospital, Kingston, Ont., reelected, and treasurer, Asa Bacon, superintendent of the Presbyterian Hospital, Chicago, reelected. It was decided to hold the next meeting of the association in San Francisco.

Prevention of Tuberculous Infection in Children.—The trustees of hospitals for consumption for Massachusetts have sent a circular letter to physicians of that state calling attention to the responsibility resting on the profession in the prevention of consumption, especially among children. The trustees suggest that it is tuberculous children who cannot stand the strain of young adult life that furnish our thousands of new cases of pulmonary tuberculosis each year. It is the opportunity of physicians, first to protect these children from infection, and second, to see that they are cared for when such infection has taken place. When actual disease is evident the case has probably gone beyond the stage when cure is possible. A diagnosis of "infection" as contrasted with a diagnosis of "disease" is the key to this problem. Physicians are requested to aid by reporting these cases, simply as a matter of record, to the State Board of Health, which will furnish special cards for the purpose.

The Plague in New Orleans.—Since the report of bubonic plague in the last issue of THE JOURNAL, three cases of human plague and eleven cases of rodent plague have been discovered. The human cases are as follows: Case 23, Max Neuman, white, male, nativity, United States; residence, 421 Harmony Street; employed at grocery store, corner Carrollton Avenue and Green Street; aged 19; sickened, August 29, with left femoral bubo. Case 24, Ethel Ticker, white, female, residence, 1742 Touro Street, corner Roman Street; sickened September 1, diagnosis positive September 2, with left femoral bubo. Case 25, Lloyd Wilson, white, male, occupation, plumber; residence, 1824 Baronne Street; sickened September 1, suspicious September 2, diagnosis positive September 3, left femoral bubo. Cases 75 to 85, inclusive, of rodent plague have also been found. During the week ended August 29, in the Department of Outgoing Quarantine, 81

vessels were fumigated with sulphur; 15 with carbon monoxide; 9,764 pounds of sulphur were burned; 15,736 tons of outgoing freight were inspected and 32 clean and 6 foul bills of health were issued. The Overland Freight Inspection Department inspected 3,925 cars; rat-proofed 1,230 cars, and condemned 9 cars. No rodents were killed in cars during the week. In the Department of Field Operations, 9,178 rats were trapped, 4 premises were fumigated, 40 premises were disinfected, 3,726 premises were inspected, 150,008 poisons were placed, 1,926 notices were served, 117 buildings were rat-proofed, 774 abatements were made and 121 dead were inspected. In the Department of Laboratory Operations, 8,235 rodents were received, of which 6,614 were examined, 18 were found suspicious and the diagnosis of plague was confirmed in 14. The total number of rodents trapped thus far is 64,063 and of these 58,599 have been examined.

CANADA

Medical Corps Organization.—Previous to 1899 there was no Army Medical Corps in Canada, each regiment having its own medical officers. At the present there is an organized system of 700 medical officers and 1,800 non-commissioned officers and men. Sir Ian Hamilton recently reported that the medical corps keeps well ahead of every other branch of the military service in its completeness and preparations for war.

Personal.—Dr. Max Klotz, Ottawa, immediate past president of the Ontario Medical Council, who has been doing graduate work in Germany, has arrived in England and will sail for home immediately.—Dr. George Strathy, Toronto, has returned from England.—Dr. Walter Wright, Toronto, is now doing work in Moorfields, London, England.—Dr. D. W. McPherson, Toronto, left the past week for Valcartier Camp near Quebec, in charge of the Army Medical Corps, Toronto. Dr. Wallace Scott was second in command.—Dr. D. A. Clark, Toronto, has gone with his regiment to the camp.—Dr. S. P. Ford, Norwood, Ontario, who has practiced in that village for fifty years, was recently tendered a banquet and a congratulatory address by the physicians of Peterboro and surrounding country.—Dr. G. G. Nasmith, bacteriologist to the Toronto Board of Health, is at Camp Valcartier watching the water supply.—Dr. George R. McDonagh has returned to Toronto from England.—Dr. William Burt, Paris, Ont., Drs. Charles J. Hastings, Herbert J. Hamilton and Augusta Stowe Gullen, Toronto, have been reelected to represent the graduates in medicine on the senate of the University of Toronto.—Dr. A. T. Shillington, Ottawa, is in charge of the medical services at Camp Valcartier. He states that out of a total of 33,000 in camp, but fifty-one have developed any illness.

WAR NOTES

Russia Organizing a Corps for Cholera Service.—The Russian authorities are considering a proposal to establish a corps for cholera service to consist of 10 medical men and 20 nurses.

Medical Service in England.—As many practitioners and panel physicians have taken places in military service, arrangements are being made to fill their places temporarily and conserve their practices during their absence.

Foreign Medical Publications.—Recent issues of foreign medical publications are exceedingly thinner in bulk and especially in original contributions. The issue of the *Lancet* for August 29 is the annual Students' Number and contains no original articles. Much space is given in current British journals to war news.

England to Manufacture Synthetic Drugs.—Agitation is being made for English chemical companies to arrange for the manufacture of German synthetic products. Duty free alcohol is being urged to aid manufacturers in this work. The patent laws are such that firms who will undertake to manufacture the necessary products at this time may continue to do so even after peace is declared. Edward White, president of the British Pharmaceutical Society, has recommended that sodium salts be substituted for potassium, as Germany is the great source of the latter.

Compulsory Antityphoid Vaccination of English Army Urged.—Sir W. B. Leishman has published a letter urging compulsory antityphoid vaccination for the British army and pointing to the American success during the mobilization in Texas. As it is impossible to vaccinate all the recruits en masse, Lord Kitchener has expressed a wish that all may be vaccinated as rapidly as occasion offers. Antityphoid vac-

cine is supplied on requisition from the Base Depot of Medical Stores, and medical officers are urged to seize every opportunity to increase the number of the inoculated.

Switzerland Appeals for Aid.—The Official Information Bureau of Switzerland, located in New York, writes that the Swiss Republic has been compelled to call to arms the entire Swiss army of 300,000 men, in order to be prepared to enforce and defend the neutrality of the country. This leaves the harvests to be gathered by the aged and by women and children, and imposes a heavy burden on the 3,500,000 population, more particularly as the customary trades and industries of the country are at a standstill. An appeal is made to Americans for contributions to meet the needs of the destitute; these may be sent to the Swiss Relief Fund, 241 Fifth Avenue, New York.

Surgical Scissors and Forceps.—Few physicians realize that all, or nearly all, surgical scissors and forceps are imported, most of them from Germany. The war, of course, has closed practically all the surgical instrument factories. A correspondent who is interested in the subject, and who has just returned from abroad, writes: "While I was in Europe I saw factory after factory where the first call took out from 60 to 85 per cent. of the men. There is no doubt but that the instrument business of this country will be in bad shape inside of the next sixty days." This means that it will stimulate and encourage our home instrument-makers to undertake the manufacture of these instruments.

Pharmaceutical Arrangements in Austria.—The Austrian Department of the Interior has issued an order requiring the public pharmacies to be kept open as far as possible. In case the proprietor or the responsible manager of the pharmacy is compelled to be absent for military service, a master of pharmacy can be entrusted with the conduct of the pharmacy without the requirement of a definite period of professional service. The order also provides that in cases in which a master of pharmacy cannot be obtained, and there is an urgent necessity for a public place for the furnishing of medicines, a medical house pharmacy can be established. The order further provides that in such cases a sign, giving the residence of the physician conducting the pharmacy, shall be distinctly displayed to the public and similarly in the case of pharmacies whose business must be suspended, a sign indicating the nearest accessible pharmacy must be displayed.

Conditions of Life in Paris.—Three weeks after the mobilization, as noted by a special correspondent to the *London Lancet*, the greatest change in Paris was in the traffic arrangements. All buses have ceased operations and the city is much more quiet. All horses and private motor cars were commandeered. The street railway ceased operations except from 7:30 a. m. to 7:30 p. m. and the wives of the employees took their places. Food conditions generally are fair and arrangements are being made to conserve the food supply. Notices have been posted urging all who have not been vaccinated in the last five years to apply at any of the hospitals or the vaccination bureaus which have been established. Directors of primary schools and medical inspectors have been instructed to vaccinate all children. Among other sanitary measures, burning of all rubbish and boiling of water have been urged. No wounded soldiers are sent to Paris for the present; they are being sent to the provinces.

Red Cross Expedition Sails.—The American National Red Cross steamer, *Red Cross*, formerly the Hamburg-American steamer, *Hamburg*, was still at New York September 9, having on board ten hospital units to assist in the care of the wounded in the European armies. Major Robert U. Patterson, M. C., U. S. Army, is in command of the detachment and the officers of the units are as follows: (1) Dr. Reynold M. Kirby-Smith, Sewanee, Tenn., director; Drs. John A. C. Colston and Martellus H. Todd, Baltimore, assistants; (2) Dr. Roades Fayerweather, Baltimore, director; Drs. Lewis C. Spencer and Harry Richmond Slack, Baltimore, assistants; (3) Dr. William S. Magill, New York City, director; Drs. Philip Newton, Washington, D. C., and Paul H. Zinkhan, Salem, Ore., assistants; (4) Dr. Robert W. Higgs, Buffalo, N. Y., director; Drs. Fred W. Eastman and Henry N. Shaw, assistants; (5) Dr. Edward H. Egbert, Washington, D. C. director; Drs. Brown S. McClintic, Peru, Ind., and Arthur M. Zinkhan, Washington, D. C., assistants; (6) Dr. Charles H. Sanders, Washington, D. C., director; Drs. John S. Spearman, Baltimore, and Grover A. C. Stem, Washington, D. C., assistants; (7) Dr. Cary A. Snoddy, Knoxville, Tenn., director; Drs. Fred G. Benton, New York City, and Walcott Denison, St. Louis, assistants;

(8) Dr. John D. Bartlett, Galesburg, Ill., director, Drs. Russell A. Jewitt, Cleveland, and John C. Miller, Shenandoah, Pa., assistants; (9) Dr. Howard W. Beal, Worcester, Mass., director; Drs. Veader N. Leonard, Baltimore, and William T. Fitzsimons, New York, assistants; (10) Lieut. Col. Bial F. Bradbury, M.C. Maine N.G., Norway, director; Drs. Robert H. Newman, Knoxville, Tenn., and John Lancer, New York, assistants. Its sailing was delayed because of protest from foreign consuls regarding the large number of Germans, not American citizens, on the crew.

Shortage of Medical Supplies in Austria.—The influence of the war on the market for drugs is felt not only in this country but even in Austria although she is an ally of Germany in which so large a part of the drugs used is manufactured. As will be seen from another item, the German Emperor has forbidden the exportation of a large number of very important drugs. The "Pharmaceutische Post" for August 8, calls attention to the effect of this law on the drug market in Austria and to the unfortunate position which a nation is in when it has to depend on other nations for its important drugs. Most chemical preparations, among them the most important alkaloids like morphin, the analgesics and hypnotics, are not produced in Austria but only in Germany, and at present cannot be imported on account of the necessities of the war.

This situation affects not only public pharmacies, but also the public hospitals and even the military hospitals which must supply their needs through the wholesale druggists. A circular from the latter has already been sent to pharmacists in which they have set forth the serious economic condition that has been called into being by the war and demand attention to these conditions on the part of pharmacists. They also make the announcement that they will furnish goods only for cash and are compelled to make an advance of 15 per cent. on all goods. Some makers of bandage material have raised the prices in their list from 40 to 80 per cent. Under such circumstances it is impossible that pharmacists shall maintain the price of medicines established by law, and permission must be given them, according to the Post, to make on their part, a corresponding increase in their charges.

The standing committee of the Vienna Medical Chamber and of the Economic Organization of Physicians of Vienna has also addressed a public request to the Vienna physicians to prescribe imported alkaloids only in the amounts absolutely necessary.

Exportation of Medical Supplies from Germany Forbidden.—In its current issue the *Pharmaceutical Post* published in Vienna, quotes from the *Berlin Drug News* the following order issued by the kaiser:

We, William, by the grace of God, German Emperor, King of Prussia, etc., in the name of the Empire, with the complete concurrence of the Bundesrat, issue the following orders:

1. The export and transport across the boundaries of the German Empire of material for dressings and remedies, as well as surgical instruments and apparatus, is forbidden until further notice.

2. The Imperial Chancellor will publish a list of articles whose export and transportation is forbidden according to Section 1. He is empowered to permit exceptions to conditions in 1 and to establish necessary regulations.

3. The present order is to take effect on the day of its announcement (publication).

In witness whereof, behold our Imperial signature and the impression of the Imperial seal.

Given at the New Palace, July 31, 1914.

(L. S.) WILHELM,
VON BETHMAN HOLLWEG.

In connection with the above, the following announcement is published:

On the basis of the second paragraph of the Imperial orders of July 31, 1914, regarding the prohibition of the export and transportation of dressing material, remedies and surgical instruments and apparatus, I make public announcement that the following articles come under this prohibition: Pure carbolic acid, mercury, corrosive sublimate, iodine, potassium iodide and sodium iodide, iodoform, chloroform, pyrazolonum phenyldimethylcum (antipyrin) and its derivatives (pyramidon, etc.), powdered opium, morphin and its salts, codein phosphate, paraformaldehyd, quinin hydrochlorid and sulphate, arecolin, salvarsan, absorbant cotton, gauze for dressings and other dressing material, surgical and other medical and dental instruments and apparatus, bacteriologic apparatus, material for bacteriologic media (agar, gelatin, peptone), vaccine virus, prophylactic sera and curative sera for infectious diseases and also experimental animals.

Berlin, July 31, 1914.

I. V. DELBRÜCK,
Imperial Chancellor.

On September 8, Representative Metz reported the raising of the export embargo on dyestuffs via Rotterdam, including medicinal products with the exception of chloroform, carbolic acid, serums and salvarsan.

LONDON LETTER

LONDON, Aug. 14, 1914.

Libel Action Against the British Medical Association

A nostrum proprietor named Stevens has brought an action against the British Medical Association for statements made in "Secret Remedies," the book in which the association has exposed various quacks. It may be remembered that last year this individual, who professes to cure consumption, brought an action in which the jury disagreed. In the present case he appeared in person. In addressing the jury he claimed that he had discovered a cure for consumption which had proved successful in his case when sent to South Africa seventeen years ago by his family doctor. In the association's book it is stated that "the vendor considerably warns the public against American quacks and impostors," but though so engagingly candid about his rivals he follows the plan of sending one letter after another to any sufferer whose name he may have obtained, a system which seems to have been invented in America. His circulars have a character of their own, because of his effrontery to the medical profession. Persons who respond receive a list of questions to be answered by their doctor and are advised to continue under his observation that he may be impressed by the marvelous qualities of the remedy. He also said, "The great drawback to my cure so far as the medical profession is concerned has been the fact that I would not reveal its formula. This is now done away with. The formula is 80 grains of umckaloabo root and 13 grains of chijitje to every ounce prepared according to British Pharmacopeia methods." The book commented on "the farce of revealing a formula by the employment of such fancy names as one of the oldest dodges of the quack medicine man." The following analysis was given: "The medicine contained in 100 fluid parts 21.3 alcohol, 1.8 glycerin and 4 solid substance; the latter contained about 1 part of tannin and 0.2 of ash. The solid substance agreed in all respects with the solids of decoction of krameria." In his advertisements Stevens guaranteed to cure the patients or to return the money in full. He also alleged that he returned to England to prove his cure to the satisfaction of the British government.

For the association evidence was produced that a man who went to see Stevens concerning some clerks in the same employ said he was subject to colds in the head. Stevens volunteered to examine him and said that his left lung was in a bad condition and gave him an injection. He subsequently saw a chest specialist who found there was nothing the matter with him. Dr. Bullock, a pathologist, said that he experimented with Stevens' remedy and found that it had no bactericidal properties, although the claim was made that a dilution of 1:100 killed tubercle bacilli. Sir Richard Douglas Powell, former president of the Royal College of Physicians, stated that he knew no remedy which would cure consumption. A physician from West Africa gave evidence on behalf of Stevens. He had heard the name "umckaloabo." It was a Kafir word meaning "life everlasting" and was applied to a plant in Kafir Land; a decoction made from it contained a vegetable parasite which was an antitoxin for chest complaints. Stevens produced several witnesses who stated that they had been cured of consumption by him. Well-known specialists gave evidence that there was no proof that these persons had suffered from consumption. It was also shown that although Stevens issued guarantee bonds promising to refund the money if a cure was not accomplished, yet when his patients died and their families, who were in poor circumstances, applied for the return of the money, he refused to give it. The jury returned a verdict in favor of the defendants. The British Medical Association is therefore to be congratulated on its successful exposure of this quack.

Jews and Consumption

It is generally held that Jews are much less liable to tuberculosis than other white races. That this view requires some qualification seems to be shown by Dr. D. L. Thomas, Health Officer for Stepney, a district in the East End of London mainly inhabited by Jews. He holds that consumption is more common among Jews than other classes and that it is undoubtedly on the increase among them. The return of cases notified and the number of deaths in certain model dwellings occupied by 5,789 Jews and 6,848 Gentiles, showed that in the buildings entirely occupied by Jews, 95 notifications were received, and there were 14 deaths or 14.7 per cent. of the persons attacked. In the buildings where there were no Jews, 26 notifications were received and there were 6

deaths, a percentage of 23 of those attacked. So that a greater percentage of Jews than of Gentiles contracted the disease, but a smaller percentage of those attacked died. These figures, adds Dr. Thomas, "tend to confirm the opinion I have frequently expressed, that pulmonary tuberculosis is more common among Jews than others and that it appears to be of a more chronic nature. Its chronic character may be the cause of its greater prevalence among Jews. Some of these chronic patients live for many years. They cough and expectorate quantities of sputum laden with tubercle bacilli, and are the center of infection for many years. The danger of this in crowded rooms or in workshops where many work in close proximity to each other, is obvious." In regard to the above statistics it must be borne in mind that the Jews in Stepney are among the poorest and most down-trodden of their race. Driven by oppression out of Russia they seek refuge in England, where they overcrowd certain slums and begin the struggle for existence at a disadvantage.

BERLIN LETTER

(Delayed in transmission)

BERLIN, Aug. 8, 1914.

The War

Although we have been prepared for years for an attack from Russia, France or England, the gigantic war in which we are now involved quite unexpectedly has naturally affected German physicians severely. In an economic way it bears on the entire profession, especially on those liable to military service by the call to service in the army. Aside from the army surgeons belonging to the standing army, the surgeons who are on furlough (reservists) were immediately mobilized. In addition, a large number of physicians in civil life who, in part, are no longer bound to military service, and in part have never performed it, have placed themselves at the disposal of the war department mostly, for hospitals which will later be erected in their own home towns. It is at present not possible to determine the number of physicians who have gone into active service, but if one estimates from comparison with the conditions in the Franco-Prussian war of 1870-1871, there would be about 12,000 physicians in the army. Naturally the question arises, How will the civil population receive medical care in the absence of so large a number of physicians? The representatives of the medical profession made immediate provision for active help in this matter. The Medical Chamber of Berlin-Brandenburg has required all the physicians of its district who are in the position to do so to assume without charge the practice of their colleagues who are in the field, and among the physicians who have already given notice of their willingness to serve in this way a representative service has already been organized. It is distinctly provided that the substitute shall fully assure the income to his colleague serving in the army or to his family. Similar measures will doubtless be taken in other parts of Germany. The task of providing that the families of physicians who are deprived of their support through service in the army shall receive material aid so far as possible is of especial importance. Also in this respect the Medical Chamber of Berlin-Brandenburg has already taken steps to the extent that the loan committee has announced that it will allow loans to the needy families without interest so far as its means permit. In the *Deutsche medizinische Wochenschrift*, it is further stated that the great fund of the League of insurance societies and which is no longer of value for its original purpose, is to be devoted, as far as possible, to the members and their families. If these and similar measures of the authorities of the profession are insufficient to provide the needed assistance, there is no doubt that physicians of the profession who remain at home will provide funds for the welfare of the profession.

The great enthusiasm which prevails among the German people expresses itself not only in the readiness to go to war, but also in the willingness for sacrifice which is necessary to provide means for the care of the wounded. Already in the first days of mobilization, a fund was provided of about \$250,000 (1,000,000 marks) by some banks and private individuals, to which the kaiser alone contributed from his private purse \$25,000 (100,000 marks). The offer of the American Red-Cross to send an expedition of three surgeons and twelve nurses with the necessary material to care for our wounded, communicated by the American government through its ambassador, has been received with marked appreciation. The resolution of the members of the Society

of American Physicians of Berlin to offer their services to the German army has been received with no less favor. Naturally, the military hospitals are of the first importance for the reception of the wounded. Next come the state and municipal hospitals which, in consideration of the enormous size of the army and the extent of the individual battles, must soon be made use of. Moreover, physicians have already offered their private clinics for this purpose. Further, some of the nobility have arranged to care for the wounded in their castles. The Kaiser Wilhelm Academy of Berlin for the instruction of army surgeons is arranged for the care of convalescents. Its doors are naturally closed to students, for the younger students have been sent into the army as nurses, and the oldest have taken an emergency medical examination and gone with the troops as assistant surgeons. Moreover, their studies have been permitted to dispense with the medical examination. In this way the number of physicians available for military service has been increased.

Thanks to the recognized excellent organization of our military sanitary service, the hope may be entertained that the fearful horror of war, so far as regards the wounding of soldiers, will be mitigated so far as possible. Further, from the same reason, we may hope that the epidemic diseases which in former wars have swept away as many or more persons than have fallen on the field of battle, will be excluded, not only from the army, but also from the civil population. That there is danger in this respect has become known to us by a report from Russia where, already for many weeks, cholera is said to be demanding not a few victims in various districts. Even an invasion of St. Petersburg by the plague has been feared.

MEDICAL AND SANITARY AFFAIRS IN VERA CRUZ

(From Our Special Correspondent)

VERA CRUZ, MEXICO, Aug. 28, 1914.

The hot season, which is also the rainy season, begins in Vera Cruz in May or June and lasts until the end of September, and as the season advances the tendency is for the death and morbidity rates for all diseases to increase, due to the heat itself, and the rapid increase in the amount of malaria; yet thanks to the effective work of our sanatoriums, this year is an exception, in that the civil death-rate for July is practically no greater than for June, in which month it was lower than the average.

The civil death-rates per thousand of population, per annum, for the months of June and July for the past five years for the city of Vera Cruz are given below; the improvement for July of this year is too great to be accidental or due to anything but improved sanitation.

	June	July
1910.....	36.86	46.86
1911.....	38.29	46.86
1912.....	44.86	49.72
1913.....	36.86	41.15
1914.....	32.00	32.58

A comparative statement of the civil deaths from communicable diseases for June and July of this year is as follows:

	June	July
Typhoid fever	1	0
Malaria	8	2
Small-pox	4	1
Dysentery	12	4
Tuberculosis	19	26
Diarrhea and enteritis, under 2 years.....	19	14
Diarrhea and enteritis, 2 years and over.....	28	23

The increase of deaths from tuberculosis is not unusual during the hot weather; the small-pox epidemic is over and there are now no cases in the city; between May 18 and July 31, 66,432 persons were vaccinated; revaccinations are now being made when indicated but general vaccinations are now with the end of July. The principal gain is due to the fall in the death-rates for malarial and intestinal diseases and this improvement is directly due to our preventive measures. The antimalarial measures which affect the civil population are three: the suppression of mosquito breeding, the use of the Army laboratory in establishing the correct diagnosis, and the following up and treatment of all proved carriers of gametes in the blood. Mosquito-breeding has been largely suppressed by the extensive and intricate system of ditches in the environs of the city, totaling about 25 miles in length; miles of vacant lots and hundreds of acres of swamp at the bases of the gigantic sand-dunes behind the city have been drained by the Health Department, and it is now possible to

sleep comfortably in almost all parts of the city without the use of mosquito-bars, something heretofore unknown at the height of the rainy season.

Malaria has been made a reportable disease by the Health Department and demonstration of the parasite in the blood is insisted on as far as possible. All houses where proved cases of malaria have occurred have been visited by inspectors trained in mosquito extermination, and secondary cases have been so far practically unknown. As a result of a partial malarial survey of the city, it has been found that the disease is principally localized along the railroad and the railroad yards. Further investigations along this line are now under way. The work has advanced far enough to demonstrate that there is very much less malaria here now than is usual at this time of the year; the Mexican physicians are unanimous in stating that the amount of *paludismo* is now very small.

The other group of diseases which have been brought under control are the dysenteries and diarrheas, and the preventive measures which seem to be directly responsible for the improvement are the following: the suppression of flies and the protection of foodstuffs in the markets by screening; the improvement in the milk-supply; and disinfection and isolation of dysenteric cases. The number of milk-venders in the city is approximately 150, and 200 samples of milk have been examined for dirt, adulteration and the percentage of fat. The milk examinations are made at irregular intervals on unannounced dates, each vender's milk being examined at least quarterly. The measure, however, which seems most directly responsible for the diminution in the number of cases and deaths from intestinal diseases is the antilfly campaign. The city water has been frequently examined in the laboratory and found uniformly good. No cases of yellow fever have originated here or been brought to the port.

The health of the troops has remained excellent, the sick-rate being only 2 per cent. from all causes, or rather less than at most garrisoned posts in the United States. Surgical cases during June and July were few, accidents and injuries, 10 cases; appendicitis, 9 cases; Hagner's operation in about 15 suitable cases has given splendid results. Dysenteries, both bacillary and entamebic have practically disappeared; in May there were 16 cases, in June, 12, in July, 2, and so far in August, 1; the only fatality occurred in May.

Malarial diseases have increased moderately; in May there were 3 cases, in June, 19, in July, 24, and in the first twenty days of August also 24. There have been no fatal and very few severe cases among the troops, since they receive early and proper treatment. Deaths among Mexicans, especially of the poorer classes, have not been infrequent during August of previous years; one Mexican physician of good standing states that ordinarily in August and September, every physician in the city may have 4 or 5 pernicious cases each day, with a high percentage of deaths. The fatalities, they state, are distinctly less since the hypodermic use of quinin has become common. They use 15 grains of quinin bichlorid in 1 c.c. of sterile water; each dose being prepared ready for use in sterile glass ampules. The injection is given deeply into the muscles, care being taken to avoid deposits of fat; abscesses do not follow unless the dose be given into the subcutaneous or fatty tissue. Fatal cases among Mexicans this year are few, and have occurred only among the very poor and ignorant.

The malarial season, beginning in May, lasts to the time of the "northers," cold gales out of the north, which begin to blow toward the end of September. We have, therefore, to look forward to at least a month more of malaria; in fact the worst part of the year is yet to come. The number of cases among both Mexicans and Americans has been kept down to a degree heretofore unattained and every effort is being exerted to exterminate the disease. As it is, many of our cases are imported, and come from localities not under our control. There is no doubt but that the malarial sick-rate of Vera Cruz can be lowered more and more each year, but to accomplish it will require time, brains and money.

No doubt Northern travelers have often wondered why the inhabitants of tropical cities live huddled together in compactly built towns, whose narrow streets are utterly devoid of shrubbery and shade trees. To one who has made a malarial survey of such a town, locating each case on a spot map, the reason is evident, for malaria creeps in through the outskirts of the city from all sides, and does not cease its advance until the older, more densely built portion of the city is reached.

Marriages

HYMAN ISAAC GOLDSTEIN, M.D., Camden, N. J., to Miss Evelyn Lipitz of Vineland, N. J., at Atlantic City, N. J., September 8.

JOHN LADA MILLER, M.D., Alliquippa, Pa., to Miss Florence Nellie Molter of Warrendale, Pa., at Sutersville, Pa., August 27.

THOMAS JOSEPH HOULIHAN, M.D., Ida Grove, Iowa, to Miss Gertrude Masterson of Chicago, at Sioux City, Iowa, August 24.

CARL EDWARDS, M.D., Wade, Ohio, to Miss Iva Keller of New Matamoras, Ohio, at Marietta, Ohio, August 20.

ARTHUR MONROE CALVERT, M.D., Lawrence, Ind., to Miss Anna May Gorby of Indianapolis, September 5.

ALBERT HERR MONTGOMERY, M.D., Chicago, to Miss Elizabeth Russell of Tulare, Cal., August 22.

THOMAS J. W. SHOEMAKER, M.D., to Miss Blanche Papanek, both of Fort Worth, Texas, August 15.

FREDERICK J. ROOST, M.D., Sioux City, Iowa, to Miss Helen Kearney of Jackson, Neb., August 29.

HAROLD H. MEREDITH, M.D., to Miss Mary Adel Palmer, both of Montrose, Colo., August 15.

CYRIL E. SHEPPARD, M.D., Larned, Kan., to Miss Helen Smith of Baldwin, Kan., August 17.

GLENN ORVILLE DAYTON, M.D., Butte, Mont., to Miss Sylvia Magin of Chicago, September 1.

Deaths

George Banghart Henry Swayze, M.D. Jefferson Medical College, 1859; one of the founders and first dean of the faculty of the Medico-Chirurgical College of Philadelphia; assistant surgeon of the One Hundred and Seventy-Eighth Pennsylvania Volunteer Infantry during the Civil War; afterward editor of a weekly newspaper in Mahanoy City, Pa.; died at his home in Philadelphia, August 22, from senile debility, aged 81.

John R. Umstad, M.D. Jefferson Medical College, 1876; a Fellow of the American Medical Association and a specialist on diseases of the eye; surgeon on the staff of the Charity Hospital, Norristown, Pa.; and for many years coroner's physician of Montgomery County; died at his home in Norristown, August 26, from typhoid fever, aged 58.

Charles T. Race, M.D. Tulane University, New Orleans, La., 1882; a member of the State Medical Association of Texas; for more than thirty years a resident of El Paso, Texas; and since 1885 an official of the city health department; assistant city health officer of El Paso; died at his home in that city; May 8, aged 62.

James B. Garvey, M.D. College of Physicians and Surgeons, Baltimore, M.D., 1884; a Fellow of the American Medical Association; for four years sheriff of Calaveras County, Cal., and for two terms superintendent of schools; died at his home in Dunmore, Pa., August 23, from acute gastritis, aged 71.

Arthur Wesley Hammer, M.D. Northwestern University Medical School, Chicago, 1911; formerly of Arbuckle, Cal.; was found dead in the bathroom of his apartment in Chicago, August 30; it is believed from water gas asphyxiation, aged 32.

Jasper T. Englerth, M.D. Physio-Medical College of Indiana, Indianapolis, 1879; physician to the German Baptist Old Folks' Home and Orphanage; died at his home in Honey Creek, Ind., August 12, aged 61.

Frederick C. Beals, M.D. University of Buffalo, N. Y., 1875; a Fellow of the American Medical Association and health officer of Salamanca, N. Y.; died at his home in that city, July 25, aged 62.

Leonard H. Spalding, M.D. University of Maryland, Baltimore, 1869; for thirty-three years a practitioner of Peoria, Ill.; died in Rochester, Minn., August 22, from heart disease, aged 69.

Henry Redlich, M.D. Rush Medical College, 1883; a member of the Illinois State Medical Society; died at his home in Chicago, August 30, aged 82.

PROPAGANDA FOR REFORM

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The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

WINE OF CARDUI

The Journal is Sued and the Company is Reported to Be Soliciting Testimonials from Doctors

The manufacturers of "Wine of Cardui" have entered suit against the American Medical Association and the editor of THE JOURNAL for \$300,000.00, presumably for the article regarding this product which appeared recently in THE JOURNAL. We say "presumably," as no details are yet to hand regarding the exact nature of the suit.

In this connection, some interesting data have just been received which we give to our readers in detail. In brief, it appears that the Chattanooga Medicine Company, which manufactures Wine of Cardui, has an agent, or agents, in the field whose purpose it is to obtain testimonials from physicians regarding the alleged value of its nostrum. Accordingly a letter, which we reproduce below, the doctors are expert testimony is desired in support of the company's product. Our correspondent says, further that the physician is told that a retainer will be given for his services and that he will be paid \$25 a day and expenses if he will favor the company by going before its attorney and making a deposition and, furthermore, that if his services as an "expert" at the Chicago trial should be needed, the company is prepared to pay \$50 a day for his services.

Our correspondent's letter detailing the attempts of the concern to obtain testimony of this sort, follows. Names, dates and places have been omitted for obvious reasons:

To the Editor: According to the statement of an agent of the Chattanooga Medicine Company who approached doctors of _____ for the purpose hereinafter stated, that published in a "Chicago paper," has brought suit for damages against that publication. The words "Chicago paper" were his own; as you will learn, particular pains were taken to conceal the fact that THE JOURNAL of the American Medical Association was the "paper" in question.

The mission of this man, according to his own account, was to secure material with which to bolster this suit. The method the Chattanooga Medicine Company is pursuing through him for the prostitution of medical men in Tennessee and Alabama to that end may be of interest to you.

Through the kindness and cooperation of Dr. _____, a local druggist, I have been able to collect the information given here. Affidavits as to any part or all of it will be furnished, if desired, by the gentlemen concerned.

Through the kindness of the activity of Mr. _____, the agent in question. While seeking to "get a line" on local physicians, he told the druggist of his plans and way of working. He vouchsafed the information that he was to employ ten doctors in Alabama and ten in Tennessee as experts for his company; also the fact that he paid each a retainer for his immediate services in signing a certain paper.

On investigation, I found that he had seen two of the three medical men he had decided on as prospects, and had been peremptorily dismissed before getting well launched into his argument. Fortunately, Dr. _____, the third "prospect" was warned that he was marked for a visit. After consulting an attorney, it was decided, in order to learn at first hand the agent's methods, and to secure, if possible, a copy of the paper mentioned above, that the doctor, when approached, should guardedly encourage the gentleman to divulge his offer in full. This was done.

Only pertinent details of the conversation of the first interview are given below; these are just as set down at the doctor's dictation immediately afterward.

William H. Person, M.D. Jefferson Medical College, 1877; a member of the Nebraska State Medical Association and for a quarter of a century a leading practitioner of the Elkhorn Valley; died at his home in Stanton, Neb., August 12.

Thomas Warren Moore, M.D. University of Pennsylvania, Philadelphia, 1869; a member of the State Medical Association of Texas; died at his home in Seguin, Texas, August 19, from cerebral hemorrhage, aged 68.

Robert Francis Gibson, M.D. Harvard Medical School, Boston, 1901; a Fellow of the American Medical Association; of West Somerville, Mass.; died at Hill, N. H., August 16, from heart disease, aged 41.

Samuel Alexander Nicholson, M.D. College of Physicians and Surgeons, Boston, 1904; a lecturer in his Alma Mater; died at his home in Bradford, Haverhill, Mass., August 18, from heart disease, aged 40.

Oliver J. Rowland, M.D. Long Island College Hospital, Brooklyn, 1899; a member of the State Medical Association of Texas and a resident of Sealy, Tex.; died in Boston, Mass., July 17, aged 38.

Ruth Bryant Leake, M.D. University of Michigan, Ann Arbor, 1891; for many years a member of the staff of Battle Creek Sanitarium; died at her home in Asheville, N. C., August 12, aged 58.

Thomas Joseph Murphy, M. D. College of Physicians and Surgeons, Baltimore, Md., 1899; a member of the Maine Medical Association; died at his home in Bangor, Maine, August 14, aged 41.

Uriel S. Wright, M.D. Washington University Medical School, St. Louis, 1871; a member of the Missouri State Medical Association; died at his home in Fayette, Mo., August 15, aged 67.

Patrick H. Mangan, M.D. Kentucky School of Medicine, Louisville, 1903; for ten years a practitioner of Central Falls, R. I.; died at his home in South Attleboro, Mass., August 12, aged 41.

Gustave F. Walker, M.D. Eclectic Medical Institute, Cincinnati, 1872; for nearly forty years a practitioner of New Orleans, died at his home in that city, August 15, aged 73.

John H. Murphy, M.D. Eclectic Medical Institute, Cincinnati, 1875; for seventeen years a resident of Fort Worth, Texas; died at his home in that city, August 18, aged 78.

Clarence K. Alger, M.D. Temple University, Philadelphia, 1909; a Fellow of the American Medical Association; died at his home in Swarthmore, Pa., August 16, aged 45.

John A. Parkinson, M.D. Jefferson Medical College, 1868; surgeon of volunteers during the Civil War; died at his home in North Athens, Tenn., August 17, aged 72.

Ira Zeno Plunkett, M.D. Marion-Sims College of Medicine, St. Louis, 1896; died at his home in Lewis, Iowa, August 13, from cirrhosis of the liver, aged 38.

Grant Safely, M.D. Colorado School of Medicine, Boulder, 1900; of Yreka Cal.; was killed in an automobile accident, near Galt, Cal., August 11, aged 42.

Joseph A. Utter, M.D. Pulse Medical College, Cincinnati, 1885; died at his home in Crawfordsville, Ind., August 19, from angina pectoris, aged 67.

Lee E. Monroe, M.D. Washington University, St. Louis, 1881; died at his home in Eureka, Mo., August 16, from cerebral hemorrhage, aged 55.

Thomas J. Watlington, M.D. Jefferson Medical College, 1857; died at his home in New Boston, Tex., May 26, from senile debility, aged 84.

Nathaniel P. Ward, M.D. Rush Medical College, 1894; died at his home in Saybrook, Ill., August 20, from pernicious anemia, aged 50.

Matthew James Glass, M.D. Trinity Medical College, Toronto, Ont., 1887; died recently at his home in Poplar Hill, Ont., aged 65.

George Nelson Dolbeck, M.D. Hahnemann Medical College, Philadelphia, 1895; died at his home in New York City, July 29.

Marshall Camp, M.D. University of Iowa, Iowa City, 1881; died at his home in Decatur, Iowa, August 14, aged 60.

William H. McConnell, M.D. Jefferson Medical College, 1857; died at his home in Brimfield, Ohio, July 24, aged 83.

Jennie E. Smith, M.D. Chicago Homeopathic College, 1879; died at her home in Chicago, August 20, aged 79.

Edward Thomas, M.D. Rush Medical College, 1860; of Scottville, Mich.; died in Manistee, Mich., August 17.

AGENT: "Doctor, _____ is my name. I am representing the Chattanooga Medicine Company. To state my business briefly, I will say that we are instituting a suit against a Chicago paper which recently made a vicious attack on one of our preparations, Wine of Cardui. At that time it was claimed that Wine of Cardui is freely drunk as booze in the South; also that the women of the South are rapidly being made drunkards by its use. Now, Doctor, we do not believe this to be true. We wish to defend the fair name of southern womanhood from this libel, and in doing so, our product as well. To support us in this suit we want your opinion and expert testimony. You are familiar with Wine of Cardui, I presume, Doctor?"

DR. _____: "Yes."

AGENT: "Do you believe what the paper says?"

DR. _____: "What you have repeated? No, I do not!"

AGENT: "Have you prescribed Wine of Cardui?"

DR. _____: "No."

AGENT: "Have you had opportunity to observe its therapeutic action?"

DR. _____: "Daily."

AGENT: "Is it your opinion, Doctor, that the therapeutic action of Cardui on the female generative organs is due to the alcohol it contains?"

DR. _____: "The alcohol in Cardui, in the prescribed dose, or in any dose, would not, so far as I know, have any special action on the uterus or appendages."

Gratified that no explosion had occurred so far, and beginning to feel sure of his ground, the agent warmed to his task. The physician was here treated to some specious but skilful flattery, which, being irrelevant, we do not give. The doctor was finally asked directly what he thought of the attack on Cardui. He responded: "It sounds interesting."

AGENT: "As I stated at the start, Doctor, it is our desire to retain you as an expert. [Producing a paper.] A retainer will, of course, be paid for your services now. I have here a paper which will give you a good idea of the kind of certificate we want to get. To save trouble, many doctors use it as a guide to go by in writing out their own."

The doctor took the paper and kept it. A copy of this document is enclosed. We have the original. [See "Specimen of Certificate Wanted," below.]

AGENT: "We will, if you will so favor us, require you to go before our attorney and make a deposition as to your belief in the things here set down; that will be better. We will pay you \$25 a day and expenses if you will do this. Also, later, it is likely we will need your services as an expert at the Chicago trial. We are prepared to pay you \$50 a day and expenses for this service."

DR. _____: "But I told you at the start that I had never prescribed Cardui; that I have never observed therapeutic effects that could be attributed to it. If that was the case with a doctor who went to Chicago in your behalf, what could he say that would be of benefit to you?"

AGENT: "That will be all right, Doctor; our attorneys will furnish you the testimony."

At this point the doctor excused himself, promising an audience the next day. I was present at that time. The agent was asked on this occasion what paper was being sued—this question had been purposely withheld before. He did not know. However, being pressed, he finally admitted that he thought it was a journal, possibly a medical journal. The two issues of THE JOURNAL in question were thrust before him. He admitted those contained the articles. His confusion was pitiful.

_____, M.D., _____.

SPECIMEN OF CERTIFICATE WANTED

I have practiced medicine for eleven years, and during that time I have frequently prescribed Cardui for women suffering from menstrual disorders with beneficial results.

I have had patients under my care who have been using Cardui, and I have noticed good results from its use. (Description of symptoms may be inserted here.)

I am positive that the therapeutic results obtained by the use of Cardui are not due to the small amount of alcohol contained in each dose.

I have known of the reputation of Wine of Cardui for many years and know it to be good.

In all my experience as a physician I have never known of the use of this medicine as a beverage.

_____, M.D.
Graduate of _____ Medical College, _____, 19____.

Some Resolutions

In view of the statements given by our correspondent, the following resolutions recently adopted by the Medical Society of Limestone County, Alabama, are of interest:

RESOLUTIONS BY THE MEDICAL SOCIETY OF LIMESTONE COUNTY, ALABAMA

Resolved, That we, members of the Medical Society of Limestone County, Alabama, being present at a regular meeting, and constituting a quorum, do hereby express our disapproval and condemnation of the methods being pursued by the Chattanooga Medicine Company in order to secure material from physicians to be used in a suit for damages against THE JOURNAL of the American Medical Association. Be it further,

Resolved, That we regard as reprehensible the efforts made by their representative, when approaching physicians on the subject, to conceal the identity of the publication being sued. Be it,

Resolved furthermore, That we regard the offer of a sum of money as a retainer to physicians besought to act in the alleged capacity of experts for the company, together with certain sums of money for certificates, depositions and testimony in favor of the said company, as nothing more or less than a technical and legal subterfuge in attempting to bribe and corrupt the members of the medical profession; this offer is so regarded because of the action mentioned in Resolution Two of these resolutions, as well as the fact that local members of the profession have been offered money to sign certificates, and to make depositions certifying facts which they had previously stated to the representative of the Chattanooga Medicine Company, making the offer they did not believe, and in some instances had plainly represented to him as being without the bounds of truth. Lastly, be it

Resolved, That the secretary of this society be authorized to attach to these resolutions the seal of the society; that they be spread on the minutes, and that a copy of the said resolutions be sent THE JOURNAL of the American Medical Association, to neighboring medical societies and to the chairman of the state board of censors.

J. S. CRUTCHER, President.

A. L. GLAZE, JR., Secretary and Treasurer.

J. F. HUGHES,

C. O. KING,

D. G. ESTES,

B. S. PETTUS, County Health Officer.

J. A. PETTUS,

J. H. MAPLES.

ANGIER'S EMULSION

Report of the Council on Pharmacy and Chemistry

Angier's Emulsion is essentially a petroleum product. When it was first put on the market commercial interests had been fostering the idea that petroleum products had food-value, and the manufacturers of Angier's Emulsion, making use of the idea, advertised it as a "food-medicine" and an "ideal substitute for cod-liver oil." The impression thus created has been kept alive through persistent advertising in spite of scientific proof to the contrary. To-day many who know that petroleum products have no food-value are still likely unconsciously to class Angier's Emulsion among nutrients. Although the manufacturers now advertise this product as "purely mechanical in its action," they yet show a disposition to profit by the old misapprehension, since, so far from expressly disavowing the old claims as erroneous, they mingle with the new ones vague claims of "tonic and reconstructive merits" apparently designed to sustain, in those who do not take time to consider the evidence carefully, the old faith in the claimed nutritive qualities of the preparation.

While the Council judges a preparation by the claims made for it at present, and not by any past misstatements when these have been thoroughly corrected, the past advertising of Angier's Emulsion so instructively illuminates the scientific worthlessness of proprietary therapeutic claims in general, and the whole course of its history is so typical that the referee has thought it well to review the subject briefly. The Council has authorized the publication of the following report.

W. A. PUCKNER, Secretary.

Angier's Petroleum Emulsion was brought out in 1881—that is to say, before the food-value of petroleum products had been experimentally disproved. Its advertising history

well illustrates the weed-like vitality of a financially profitable therapeutic fallacy. The shifting claims made for this preparation are such good examples of the generally unreliable therapeutic pretensions of proprietary medicines—whether of the "patent medicine" or of the "ethical proprietary" type—that it has been deemed advisable to present a brief review of the conflicting claims made for it at various times.

A PETROLEUM PRODUCT

Angier's Emulsion is described by the manufacturers as containing, in addition to "our specially purified Petroleum," "the combined hypophosphites of lime and soda, chemically pure glycerine, and the necessary emulsifying agents." So far as the hypophosphites are concerned, it is probably unnecessary to remark that the latest researches bring to light no evidence that they influence metabolism in the slightest degree. The Angier Chemical Company apparently accepts this view, for in its advertising stress is laid exclusively on the merits of the emulsion as a petroleum product. It is therefore proper to consider it from this point of view.

The history of the internal use of liquid petrolatum was sketched in a recent Council report.¹ As mentioned at that time, a number of petroleum products were put on the market some thirty years ago as substitutes for lard and butter. Contemporary opinions regarding the food value of such products differed widely.

There never was any scientific evidence to support the view that petroleum and its derivatives are assimilable by the animal organism. In fact, so far as we can learn, there was no scientific investigation of the problem until Randolph's experiments in 1884. These were probably the first to demonstrate the non-absorbability of petroleum and its valuelessness as a foodstuff.

In 1899 Robert Hutchison conclusively demonstrated by experiment that petrolatum, paraffin and related products were absolutely unassailable by any of the digestive fluids, and therefore could not possibly have any food value. Various investigators later confirmed these findings.

FIRST ADVERTISED AS A "FOOD-MEDICINE"

Let us now take up the advertising history of this nostrum. In 1885 it was sold under these claims:

"... a 'Food-Medicine' that is far more than a substitute for cod-liver oil";
"... a Food-Medicine that is readily assimilated and helps to digest other foods."

In 1897 it was an:

"Ideal Substitute for Cod Liver Oil."

In 1899 it:

"... conserves heat and energy by furnishing more material for oxidation."

In 1902 it:

"... supplants tissue waste by tissue reconstruction."

The promoters of Angier's Emulsion thus for some time ignored the status definitely assigned to petroleum products by the experiments of Randolph, Hutchison and others. This was only natural. If petrolatum was absolutely inert in the alimentary canal (and this was now proved beyond controversy) then an emulsion prepared from it most certainly was not a "food-medicine," could not "supplant tissue waste," or "conserve heat and energy." All the credit which previous "unterrified and ingenious advertising" (to quote Hutchison) had accumulated for Angier's Emulsion was bound up with the view that petroleum products were foodstuffs.

LATER ADVERTISED AS NON-ABSORBABLE

The non-absorbability of liquid petrolatum, however, suggested to Robinson, Schmidt, Lane and others, a new therapeutic use for it in the treatment of chronic constipation. This method has rapidly gained popularity and it is not surprising, therefore, that the promoters of Angier's Emulsion

changed their claims accordingly, and now began to base their advertising chiefly on the proved properties of petrolatum. In 1910 the emulsion was advertised for the treatment of chronic diarrhea on these grounds:

"... given by the mouth, it passes to the lowermost portions of the intestines without changing its identity; hence it exerts antiseptic, soothing and demulcent properties upon every inch of the intestinal tract, from the duodenum to the rectum."

The old claims, however, were not discarded altogether, for in 1911 the preparation was recommended for children's diseases as:

"... an aid to appetite and digestion and a splendid tonic and bulder."

Before long the attempt was made to weave together the claims based on opposed and mutually incompatible properties. In 1912 we find Angier's Emulsion recommended because it:

"... corrects digestive disturbance and promotes normal action of the bowels. At the same time it has a most invigorating tonic influence upon the general health."

In 1914 medical men are advised through the advertising pages of the *British Medical Journal* of the:

"... tonic and reconstructive merits of Angier's Emulsion."

A pamphlet on "Constipation," which is "Presented to Physicians with Compliments of the Angier Chemical Company" (copyright, 1913; still distributed in 1914) informs physicians that Angier's Emulsion is:

"... purely mechanical in its action."

Notwithstanding this, we are told later on in the same pamphlet that it:

"... facilitates, hastens and assists the processes of digestion and assimilation." "It is a most efficacious remedy in Pulmonary Tuberculosis because it not only maintains normal nutrition, but also exerts a well-defined specific palliative influence upon the cough and other symptoms of the disease."

Evidently the advertisement is written in the hope that in one paragraph a claim based on the proved properties of petroleum products may be substantiated, while in another a totally different and inconsistent claim may be glibly insinuated in vague phrases designed to lull thought and thus perform the remarkable feat of securing credence for two contradictory statements.

UNWARRANTED AND MISLEADING CLAIMS

Further evidence that Angier's Emulsion is at present exploited both to the medical profession and to the public under claims that are unwarranted and misleading, if not as palpably untrue as the claims made in the past, is found on the wrapper of a trade package purchased in 1914 and in the circular accompanying it. Note the following:

"Indicated in Diseases of the Throat and Lungs and of the Digestive Apparatus. Useful in General Debility and Wasting Diseases, Especially when due to Faulty Nutrition. The antiseptic properties of the Emulsion particularly adapt it to the treatment of diseases of septic or bacterial origin."

"Angier's Petroleum Emulsion is indicated in affections of the throat, lungs and intestinal tract—both subacute and chronic. In diseases of the digestive apparatus due to catarrhal, ulcerative or tuberculous conditions, its peculiar soothing, healing and aseptic properties make its use especially beneficial. Wasting diseases, particularly when due to faulty nutrition, are greatly benefited by its use, one of the most noticeable effects being a prompt and decided increase in weight."

It is, of course, unnecessary to point out that, since petrolatum is non-absorbable, Angier's Emulsion contains no ingredient capable of affecting the respiratory mucous membrane except by local application, for which, indeed, this preparation is evidently not intended.

COMPOSITION AND FORMULAS

According to a circular which was contained in a trade package recently purchased

"Each fluidounce of Angier's Petroleum Emulsion with hypophosphites contains: 33¼ per cent. of our specially purified Petroleum; 9 grains of the combined hypophosphites of lime and soda, chemically pure glycerin and the necessary emulsifying agents."

1. Liquid Petrolatum or "Russian Mineral Oil," Propaganda Department, *The Journal A. M. A.*, May 30, 1914, p. 1740.

As regards the nature of the product referred to under the indefinite term "petroleum" the circular states that Angier's Emulsion is:

"... prepared with refined petroleum specially purified for the purpose. By a process peculiarly our own the crude petroleum, obtained from special wells is so purified that all taste and odor and all objectionable and irritating properties are removed, while the full medicinal value of the oil is retained."

The composition assigned to Angier's Emulsion in an advertising pamphlet "The Petroleum Idea," issued in 1907 differs in that it is said to contain "specially purified crude petroleum" and that each fluidounce is said to contain 2.84 grains of benzoate of sodium. While these quotations convey the impression that certain medicinal constituents of the "specially purified" product obtained from "special wells" are "retained," a pamphlet recommending the use of Angier's Emulsion for the treatment of constipation assures us that it produces the "mechanical effects of the purest petroleum" and that it is "purely mechanical in its action."

LABORATORY REPORT

The statements regarding the identity of the "petroleum" are so unsatisfactory and contradictory (in one place "refined petroleum specially purified for the purpose," in another "specially purified crude petroleum"—in one place "medicinal" and in another "purely mechanical in its action") that the help of the Chemical Laboratory of the Association was invoked to establish the character of the petroleum product and to determine the presence or absence of sodium benzoate. At one time declared by the manufacturers to be present but later omitted from the formula. The Association's chemists reported:

"From a specimen of Angier's Emulsion recently purchased there was separated by the customary methods of analysis, a yellow fluorescent, unsaponifiable, semi-solid residue which has all the properties of ordinary yellow petrolatum of a consistence somewhat softer than the product described in the Pharmacopeia. It was much more dense than the colorless, non-fluorescent liquid petrolatum now in vogue as a laxative. The preparation contained benzoate, both in the form of free benzoic acid and also in the form of a water-soluble salt probably sodium benzoate."

The petroleum product contained in the emulsion was thus shown to be intermediate between the ordinary (solid) and the liquid petrolatum. It also appears that a benzoate is still present, though no longer mentioned in the formula.

2. As is the custom in the exploitation of proprietary medicines, the preparation which is the firm's main output—the leader—is made to do duty as an advertising medium for auxiliary preparations. Thus the Angier Emulsion booklet advises the use of Angier's Throat Tablets. These tablets are alleged to be composed essentially of elm bark and petroleum, are claimed to "promote appetite and aid digestion," and it is stated that "their healing action on all mucous surfaces makes them decidedly beneficial, not only to the pulmonary tract but on the digestive areas as well." Angier's Throat Tablets were examined in the Association's Laboratory to determine the amount and kind of petroleum present in the tablets. Extraction of the tablets with ether yielded a petroleum product which resembled in every way the product obtained from the emulsion. Slightly less than 12 per cent. of the tablet was composed of the petroleum oil. The part insoluble in ether appeared to consist essentially of elm bark, with gum and sugar.

The Laboratory and the Clinic.—There are few more significant principles contributing to form the substratum of good and successful work at the bedside than a just estimate of the correct relationship between clinical and experimental work, and lack of the requisite clearness of mental vision in this matter is, I believe, one of the most potent causes of unexplained disappointment and failure. We sometimes observe a man of high intellectual power, honest, painstaking and industrious, who seems to fail unaccountably, and by that I do not mean in respect of wordly advancement and public estimation, but he fails in the actual practice of his profession at the bedside. If I were asked to state in general terms what in my opinion is the most frequent defect that underlies this regrettable phenomenon, I should reply without hesitation, "Inability to distinguish clearly between the teachings of the laboratory and those of the bedside"—R. Hamilton Russell. *British Medical Journal.*

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

DISINFECTION OF LIBRARY BOOKS

To the Editor:—1. Can books, say of the circulating department of a public library, be properly disinfected? If so,

2. What is the best method?

3. What would you do with public library books used in families in which there is an open case of tuberculosis (pulmonary) (a) disinfect them, (b) destroy them, and deny family further privileges of the library?

4. Have you any suggestions on this important question of disseminating disease by means of schoolbooks and books of circulating departments of public libraries?

J. VANDER LAAN, M.D., Muskegon, Mich.

ANSWER.—1. Yes.

2. The best disinfecting agent is formaldehyd gas, and the books should be thoroughly opened. They should be arranged on perforated wire trays and exposed to the gas for twelve hours at a temperature of 80 C. (176 F.). When only a few books are to be treated, in the absence of a special apparatus, they may be disinfected by placing two or three drops of a 40 per cent. solution of formaldehyd on every second page. The book is then laid in a closed box or barrel in which more formaldehyd solution has been sprinkled and left in a warm place for not less than twenty-four hours.

3. Tuberculosis is not usually regarded as sufficiently contagious to necessitate the disinfection of books. Without doubt, however, a sufficient degree of safety can be attained by disinfection without denying the tuberculous patient and family the privileges of the library.

4. See THE JOURNAL, April 20, 1912, p. 1201.

The danger of infection of any sort being conveyed by books is very slight. If the books are kept out of circulation for a short time or simply filled with formaldehyd, if they must be "disinfected," no one need fear that books will be much of a factor in disseminating disease.

ANTISEPTIC ACTION OF HEXAMETHYLENAMIN

To the Editor:—Please let me know whether an article was published in THE JOURNAL a few years ago, stating that as a result of experiments carried on, it was found that hexamethylenamin was an antiseptic independent of its formaldehyd content.

S. W. MARICK, M.D., Pittsburgh.

ANSWER.—Such an article has not been published in THE JOURNAL within the last five years. In an abstract of an article by L. B. Wiggs, entitled "Pharmacologic and Clinical Aspects of Hexamethylenamin" (*Southern Medical Journal*, December, 1910, abstracted in THE JOURNAL, Jan. 14, 1911, p. 152) it is stated that "the drug—as such—has only mild antiseptic properties and is probably, in part at least, absorbed unchanged." A statement was made in Queries and Minor Notes (THE JOURNAL, May 18, 1912, p. 1527) to the effect that hexamethylenamin in itself is somewhat antiseptic, but not markedly so. At that time it was believed that hexamethylenamin broke up in the tissues, liberating formaldehyd, and the answer to the query referred to held that the statement that "its value lies in the fact that it breaks up in the tissues and thus formaldehyd is liberated, is fully justified." In an editorial, July 6, 1912, page 38, it is said that "the theory of its (hexamethylenamin's) action centers in the liberation of formaldehyd from the compound on treatment with acid." It appears that the opinion that hexamethylenamin is antiseptic independently of the liberation of formaldehyd was an assumption not founded on reliable experimental evidence. The recent investigations of Burnam, Hanzlik and others have shown that its action as an antiseptic depends on the decomposition into formaldehyd and ammonia, which occurs only in an acid medium.

ORIGIN OF THE NAME "WALDEYER'S RING"

To the Editor:—Please give the origin of the name "Waldeyer's ring" as applied to the pharyngeal, faucial and laryngeal tonsils.

J. W. D.

ANSWER.—This name was given in honor of the German anatomist, Heinrich Wilhelm Gottfried Waldeyer, born in 1836.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

COLORADO: Denver, October 6. Dr. David A. Strickler, Empire Bldg., Denver.
DISTRICT OF COLUMBIA: Washington, October 13-15. Sec., Dr. George C. Ober, 125 B. St., S. E., Washington.
GEORGIA: Atlanta, October 13-15. Sec., Dr. C. T. Nolan, Marietta.
IDAHO: Wallace, October 6. Sec., Dr. John F. Schmershall, Jerome.
ILLINOIS: Chicago, October 6-8. Sec., Dr. C. St. Clair Drake, Springfield.
KANSAS: Topeka, October 13-15. Sec., Dr. H. A. Dykes, Lebanon.
MICHIGAN: Lansing, October 13-15. Sec., Dr. Beverly D. Harrison, 504 Washington Arcade, Detroit.
MINNESOTA: Minneapolis, October 6-9. Sec., Dr. Thomas McDavitt, Lowry Bldg., St. Paul.
MISSOURI: Kansas City, September 28-30. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.
MONTANA: Helena, October 6. Sec., Dr. William C. Riddell, Helena.
NEW MEXICO: Santa Fe, October 12. Sec., Dr. W. E. Kaser, East Las Vegas.
NEW YORK: September 22-25. Chief of Examination Division, Mr. Harlan H. Horner, Department of Education, Albany.
OKLAHOMA: Muskogee, October 6-8. Sec., Dr. John W. Duke, Guthrie.
RHODE ISLAND: Providence, October 1-2. Sec., Dr. Gardner T. Swarts, State House, Providence.
WEST VIRGINIA: Clarksburg, October 13. Sec., Dr. S. L. Jepson, 81 Twelfth St., Wheeling.

New York January Report

Mr. H. H. Horner, secretary of the Examination Division of the New York Education Department, reports the written examination held at Albany, Buffalo, New York and Syracuse, January, 1914. The number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 117, including one osteopath, of whom 73 passed, including one osteopath, and 44 failed. The following colleges were represented:

College	PASSED	Year Grad.	Total No. Examined
University of Colorado		(1905)	1
Yale Medical School. (1906, 1); (1911, 1); (1912, 2); (1913, 1)		(1912)	5
Georgetown University		(1912)	1
Johns Hopkins University (1904, 1); (1907, 1); (1911, 2); (1912, 1)		(1910)	5
Dartmouth Medical School		(1910)	1
Albany Medical College		(1912, 3); (1913, 5)	8
College of P. and S. in the City of New York		(1894)	1
Columbia Univ., College of P. and S. (1911, 1); (1912, 3); (1913, 6)		(1911, 1); (1913, 1)	10
Cornell University		(1911, 1); (1913, 1)	2
Fordham University		(1911, 1); (1912, 1); (1913, 4)	6
Long Island College Hospital		(1912, 2); (1913, 5)	7
New York Homeo. Med. Coll. and Flower Hosp. (1910, 1); (1913, 1)		(1911, 2); (1912, 3); (1913, 4)	2
Syracuse University		(1911, 2); (1912, 3); (1913, 4)	6
University and Bellevue Hospital Med. Coll.		(1913)	6
University of Buffalo		(1912, 1); (1913, 2)	3
Jefferson Medical College		(1912, 1); (1913, 1)	2
University of Vermont		(1912)	1
Medical College of Virginia		(1911)	1
University of Toronto		(1906, 1); (1911, 2)	3
Royal Imperial University, Vienna		(1912)	1
FAILED			
University of California		(1900)	1
Yale Medical School		(1911)	1
Georgetown University		(1913)	1
George Washington University		(1905)	1
Howard University		(1902)	1
Chicago College of Medicine and Surgery		(1912)	2
College of Physicians and Surgeons, Chicago		(1902)	1
Tulane University of Louisiana		(1908)	1
Baltimore Medical College		(1913)	1
College of Physicians and Surgeons, Baltimore		(1912)	1
University of Maryland		(1911)	1
Tufts College Medical School		(1910, 1); (1913, 1)	2
Univ. of Mich. Homeo. Med. Coll.		(1911, 1); (1912, 1)	2
Albany Medical College		(1913)	1
Columbia Univ., College of P. and S.		(1913)	1
Fordham University		(1913)	2
Long Island College Hospital		(1913)	2
New York Homeopathic Medical College		(1882)	1
New York Homeo. Med. Coll. and Flower Hosp.		(1913)	1
Syracuse University		(1912, 1); (1913, 1)	2
University and Bellevue Hosp. and Med. Coll.		(1913)	3
University of Buffalo		(1913)	4
Jefferson Medical College		(1912)	2
Hahnemann Med. Coll. and Hosp., Philadelphia		(1911)	1
Medico-Chirurgical College of Philadelphia		(1912)	1
Woman's Medical College of Pennsylvania		(1912)	1
Laval University, Quebec		(1900)	1
Royal Univ. of Naples, Italy (1897, 1); (1905, 1); (1912, 1); (1913, 1)		(1910)	4
Royal University of Rome		(1910)	1

Book Notices

FEEBLE-MINDEDNESS: ITS CAUSES AND CONSEQUENCES. By Henry Herbert Goddard, Ph.D., Director of the Research Laboratory of the Training School at Vineland, New Jersey, for Feeble-Minded Girls and Boys. Cloth. Price, \$4 net. Pp. 599, with illustrations. New York: The Macmillan Company, 1914.

In this book is embodied a report of the work done during the last five years in the Vineland Research Laboratory. An attempt was made to ascertain the cause of feeble-mindedness of the children in that institution. Three hundred and twenty-seven cases are reported, the research including a detailed study of the heredity as ascertained by a field investigation. The greatest stress is laid on this factor, although each case was thoroughly analyzed from every point of view. The summarized study has led the author to believe that intelligence is inherited according to the mendelian law. This conclusion is, of course, of great importance. Based on so large a series of cases as this, it must necessarily be given the most serious consideration, although this research is but preliminary to further studies along the same line. It has been done with a thoroughness which warrants a belief that future studies will have an equally valuable outcome. The cases are divided up into groups, according to various chief factors underlying the conditions in each instance. There are numerous plates illustrating the features of the different cases, and several chapters explaining the line of study followed and the reasoning process by which Dr. Goddard arrived at his conclusions. The language is simple and the diagrams extraordinarily clear.

DEFENSIVE FERMENTS OF THE ANIMAL ORGANISM AGAINST SUBSTANCES OUT OF HARMONY WITH THE BODY, THE BLOOD-PLASMA AND THE CELLS. Their Demonstration and Their Diagnostic Significance for Testing the Function of Different Organs. By Emil Abderhalden, Director of the Physiological Institute of the University at Halle. English Translation by J. O. Gavrinsky, L.R.C.P., M.R.C.S., M.D., and W. F. Lancaster, M.A. Third Edition. Cloth. Price, \$2.75 net. Pp. 242, with 11 illustrations. New York: William Wood & Co., 1914.

The date of translation of this edition of Abderhalden's work is Feb. 3, 1914, approximately twelve years since the beginning of the fundamental work of the author. In that period there is hardly a single branch of medicine to which the application of this method has not been made. The basic researches are the chief feature of the present volume. The technic of the test is outlined, and there is a chapter on sources of error which will aid the reader toward a greater surety that his work is worthy and reliable. How important this is may be judged from Abderhalden's statement in the preface to the effect that "every research which has not been carried out with absolutely unobjectionable technic delays our arrival at a clear appreciation of the methods." In view of the growth of the subject the author has not attempted to give a complete bibliography, but merely to list and criticize the more important papers which have been published. The time is not yet ripe for drawing final conclusions, but enough has been done to show that important advances are being made. This little guide is a valuable aid to a continuation of the early steps.

DIE OPERATIVEN ERTOLGE BEI DER BEHANDLUNG DES MORBUS BASEDOWII. Von San.-Rat Dr. Otto Klink, Direktor der Provinzial-Heilund Pflegeanstalt in Lublinitz. Paper. Price, 4 marks. Pp. 112. Berlin: S. Karger, 1914.

In this brochure the author carefully reviews the literature of the subjects from 1880 to 1914 and divides this period into two parts, the first from 1880 to 1894, which he calls the old, and the second from 1894 on, which he calls the new. While the number of the articles reviewed is considerably over one thousand, yet the author says that it cannot be said to be exhausted in all directions. Statistics are tabulated showing the results of 6,825 operations for goiter in which Basedow symptoms were present, and 8,992 operations in which Basedow symptoms were not present, making an interesting and instructive study. In the extensive bibliography

at the end, American contributions are conspicuous by their absence. In reviewing the literature in this way it is interesting to note the gradual development of the dominant present-day ideas concerning the nature of this disease and the influence which the operative treatment has had in determining them.

DIAGNOSTIC METHODS, CHEMICAL, BACTERIOLOGICAL AND MICROSCOPICAL. A Text-Book for Students and Practitioners. By Ralph W. Webster, M.D., Ph.D., Assistant Professor of Pharmacological Therapeutics in Rush Medical College, University of Chicago. Fourth Edition. Cloth. Price, \$4.50 net. Pp. 738, with 208 illustrations. Philadelphia: P. Blakiston's Son & Co., 1914.

Less than a year has passed since the publication of the third edition of this work. However, through suggestions from several sources, the author has been able to add to it several subjects not previously discussed and of importance to physicians who wish to be thoroughly conversant with laboratory methods. Among them are, for example, discussions of Kowarsky's method of determining glucose in the blood; several methods for staining spirochetes in the tissues; Lange's colloidal gold test for congenital syphilis, and the newer applications of Abderhalden's method. To those familiar with the laboratory and its uses, no recommendation of this book is necessary. Physicians who desire a ready reference work for the later as well as the commonly used diagnostic methods will find it invaluable.

DENTAL JURISPRUDENCE. An Epitome of the Law of Dentistry and Dental Surgery. By Elmer D. Brothers, B.S., LL.B., Professor of Medical and Dental Jurisprudence in the University of Illinois. Cloth. Price, \$2. Pp. 220. St. Louis: C. V. Mosby Company, 1914.

This is a general review and an analysis of the principles and rules of law affecting the practice of dentistry. Since dentistry is, in a sense, a branch of medicine, the laws, procedures and decisions that apply to medicine also apply to dentistry. As a matter of fact, almost all the references given in this book are to medical cases. The author has presented the subject in a concise manner, and in terms that are both clear and non-technical. It is a book that should be in the hands of every dentist, or at least of those who are not thoroughly conversant with their responsibilities under the law. And, since the matter is so near-medical, physicians will find it full of good advice and information.

Medicolegal

Strong Declaration of Liability Against Hospitals with Charitable Foundations

(*Lindler vs. Columbia Hospital of Richland County (S. C.)*, 81 S. E. R. 512)

The Supreme Court of South Carolina affirms a judgment for damages in favor of the plaintiff, who was burned on a hot-water bottle. The court says that this is the first case in that state on the question: Is a hospital with a charitable foundation liable to patients for injuries caused by the negligence of the employees? It has been stated that the doctrine of immunity from damage suits originally arose in cases in which hospitals were operated by government agencies. If the doctrine had been confined to its original declaration, there would have been no trouble; but, when the exempting circumstance does not exist, the immunity ought not to exist. The result of these holdings is that, when a small charitable foundation is secured, a hospital may be opened; patients secured, who go there under an invitation that promises skilled physicians, competent trained nurses; advantages promised that cannot be secured at home; then, when the patients are secured, they may be neglected, burned with fire or vitriol, put into beds from which other patients afflicted with contagious, loathsome, and it may be disgraceful diseases have been taken, and we are told that there is no remedy except to sue, though the injured party may be a poor, overworked, broken-down, friendless, helpless woman. The court is not reflecting on the defendant hospital; it is

ready to believe that the injury here was simply one of those acts of inadvertence that sometimes befall the most careful of men and women. The thing against which it protests is the absolute immunity, given to all hospitals that can secure a charitable foundation, from the most brutal and inhuman treatment of those unfortunate men and women who may be carried (sometimes without their knowledge or consent) within the hospital walls, under an implied contract. Some of the cases hold that the pay patients, when they enter a hospital with a charitable foundation, are really charity patients, and the weekly sums they are required to pay are not payments at all, but contributions to the charity fund. This is brilliant, but is not convincing. This court thinks the first duty of every man and the first call on every fund is to repair the evil of its own doing, and then the remaining fund or remaining strength may be devoted to charity. The court does not think it wise or safe to allow an institution to exist with unlimited power to do evil, and make that institution powerless to repair the evil, because some good man or woman has contributed a fund and intended thereby to do good. The court knows that a trust fund cannot be diverted to a different purpose from that for which it was created; but the purpose of the trust is to relieve suffering, and not to increase it. When, in the administration of the trust, suffering is increased, the purpose fails. The courts that declare immunity are destroying and not maintaining the trust.

Conviction for Publishing Obnoxious Advertisement Affirmed

(*People vs. Kowalski (Mich.)*, 146 N. W. R. 177)

The Supreme Court of Michigan affirms a conviction of the defendant for an offense defined and made punishable by the provisions of Act 164, Public Acts of 1907, namely, that, being a duly registered practitioner in medicine, she inserted or caused to be inserted and printed in a newspaper an advertisement obnoxious to the statute. The jury were instructed that it was not necessary to find, in order to convict this defendant, that she personally went over and caused the advertisement to be inserted. It was sufficient if she caused it to be inserted either in person or by her duly authorized agent. If she was the responsible moving party, who incited or procured the publication of that advertisement, and if it was of the character penalized by the statute, namely, if it was an advertisement with reference to diseases of the genito-urinary organs, or venereal diseases, or containing obscene or offensive matter, she would be just as guilty as though she went over and put it in herself. The mere fact that she did it through somebody else, if she did it, did not relieve her from responsibility; but the jury must be satisfied, in order to convict her, that she knew it was going in, was responsible for its going in, paid for it, knowing what she was paying for. That was a correct statement of the law, which, in the language employed by the court or in some suitable language, the people were entitled to have given to the jury.

Society Proceedings

COMING MEETINGS

Amer. Academy of Ophthal. and Oto-Laryn., Boston, Oct. 19-21.
Amer. Assn. of Obstetricians and Gynecologists, Buffalo, Sept. 15-17.
American Association of Railway Surgeons, Chicago, Oct. 14-16.
American Electro-Therapeutic Association, Battle Creek, Sept. 15-17.
Association of Military Surgeons of the U. S., Cincinnati, Sept. 29-Oct. 2.
Delaware State Medical Society, Wilmington, Oct. 13-14.
Idaho State Medical Association, Boise, Oct. 8-9.
Indiana State Medical Association, Lafayette, Sept. 24-25.
Kentucky State Medical Association, Newport, Sept. 23-25.
Med. Soc. of the Mo. Valley, Des Moines and Colfax, Ia., Sept. 17-19.
Minnesota State Medical Association, St. Paul, Sept. 30, Oct. 1-2.
Mississippi Valley Med. Assn., Cincinnati, Oct. 27-29.
Nevada State Medical Association, Reno, Oct. 13-15.
New Mexico Medical Society, Albuquerque, Oct. 5-7.
Pennsylvania State Medical Society, Pittsburgh, Sept. 21-24.
Utah State Medical Association, Salt Lake City, Sept. 29-30.
Vermont State Medical Society, Rutland, Oct. 8-9.
Virginia Medical Society, Washington, D. C., Oct. 27-30.
Washington State Medical Association, North Yakima, Sept. 21-23.
Wisconsin State Medical Society, Oshkosh, Oct. 7-9.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia
August, CXLVII, No. 2, pp. 137-312

- 1 *Syphilis of Liver, Imitating Cirrhosis. W. F. Cheney, San Francisco.
- 2 *Syphilis of Vertebral Column: Its Symptomatology and Neural Complications. J. R. Hunt, New York.
- 3 Syphilis of Esophagus. U. J. Wile, Ann Arbor, Mich.
- 4 Schistosomiasis Japonica: Study of Two Cases. D. Eovaird and R. L. Cecil, New York.
- 5 *Absence of Hyperplasia of Remainder of Thyroid in Dogs after Piecemeal Removal of Gland. Autotransplantation of Thyroid in Partially Thyroidectomized Animals. J. A. Hunnicutt, Baltimore.
- 6 Pituitary Disease: Report of Three Cases. A. D. Dunn, Omaha, Neb.
- 7 Mental Manifestations in Tumor of Brain. A. Gordon, Philadelphia.
- 8 Peripheral Pigmentation of Cornea, Associated with Symptoms Simulating Multiple Sclerosis. T. B. Holloway, Philadelphia.
- 9 Infantile. A. Strauch, Chicago.
- 10 Smegma Bacillus. G. E. Brereton and K. W. Smith, Madison, Wis.

1. **Syphilis of Liver Imitating Cirrhosis.**—Cheney urges that in any case that appears to be cirrhosis of the liver, judging from clinical history and physical signs, the blood should always be examined for syphilis. If the Wassermann reaction is positive, vigorous specific treatment will often produce marvelous improvement not to be expected in any other way; but even when the reaction is not positive, the liver disease may be luetic, and so specific therapy may prove of no avail; yet at the same time the therapeutic test will have given valuable information and have done no harm. There is no certain way to tell which case of hepatic cirrhosis is luetic and which is not, except by the blood test, for previous history of infection, or of other earlier manifestations of syphilis, as well as stigmata produced elsewhere in the body by the disease, may all be lacking absolutely; while there may be nothing about the condition of the liver on physical examination or the symptoms it produces, to determine the etiology or to distinguish ordinary portal cirrhosis from luetic.

2. **Syphilis of Vertebral Column.**—Syphilitic spondylitis and perispondylitis while rare, Hunt says, are nevertheless sufficiently frequent to be given careful consideration in every case of acute or chronic rheumatic affection, or may be sudden, simulating an acute rheumatic affection, or it may develop gradually and run an exceedingly chronic and protracted course. Localization in the cervical region, especially, should awaken the suspicion of lues, as more than half of the recorded cases are of this region. It may, however, occur in any portion of the spinal column. Of 100 cases available for analysis, Hunt found that 25 per cent. were associated with some complication referable to the nervous system. These were either of the nerve roots and plexus or of the spinal cord itself. Generally speaking, in this group of cases with neural complications, the symptoms indicated a lesion of the spinal cord in two-thirds; in the remaining third, the neural symptoms were limited to an involvement of the nerve roots or plexus.

5. **Hypertrophy of Thyroid in Dogs.**—According to Hunnicutt three-fourths of the dog's thyroid gland may be removed without appreciably affecting the remainder of the gland. In only 3 of the 59 dogs on which the operation of piecemeal removal was performed did the remaining gland change from a normal to a hyperplastic state. In 5 of the 59 dogs the remaining gland reverted from the early hyperplastic state to the normal state. Where a diagnosis of some degree of hyperplasia was made at the first operation, the pieces removed from the same dogs at subsequent operations had not undergone further hyperplasia. Of the pieces removed from 56 dogs at the first operation, 58 per cent. were normal, 32 per cent. showed early glandular hyperplasia; 5 per cent. marked glandular hyperplasia, and 5 per cent. very early glandular hyperplasia. Definite increase in the size of the remaining gland (hypertrophy) was not observed. The

remains of the thyroid lobes, the accessory thyroids, and the successful grafts in a given dog, presented the same histologic picture. In no dog was myxedema or tetany observed in which as much as one-fourth of the thyroid and one parathyroid gland were preserved.

Annals of Ophthalmology, St. Louis

July, XXIII, No. 3, pp. 445-604

- 11 Parenchymatous Keratitis. A. Alt, St. Louis.
- 12 Case of Papillary Iritis following an Injection of Salvarsan. C. Loeb, St. Louis.
- 13 Paralysis of Ocular Muscles. J. F. Shoemaker, St. Louis.
- 14 Ocular Symptoms of Syphilis of Nervous System. M. Wiener, St. Louis.
- 15 Therapeutics of Ocular Lues. W. F. Hardy, St. Louis.
- 16 Salvarsan and Eye. J. Green, Jr., St. Louis.
- 17 Case of Thrombosis of Retinal Vein. J. H. Claiborne, New York.
- 18 Case of Double Inversion. G. F. Arps, Columbus.
- 19 Steel in Eye and Suicide. J. H. McCassey, Dayton.
- 20 Dacryocystitis Caused by Membranous Closure of Nasal Duct. M. Wiener and W. E. Sauer, St. Louis.

Annals of Surgery, Philadelphia

August, LX, No. 2, pp. 137-280

- 21 *War Surgery. A. de Page, Brussels.
- 22 *Amputations. O. Witzel, Dusseldorf.
- 23 Amputation of Hand. P. von Kuzmik, Budapest.
- 24 *Free Transplantation. E. Lexer, Vienna.
- 25 *Tissue and Organ Transplantation. E. Ullman, Vienna.
- 26 *Chronic Ulcers of Stomach and Duodenum. W. J. Mayo, Rochester, Minn.
- 28 *Ulcer of Stomach and of Duodenum. H. Hartmann and P. Lecene, Paris.
- 29 Diagnosis of Gastric and Duodenal Ulcer. F. de Quervain, Basel.
- 21, 22 and 24. Abstracted in THE JOURNAL, May 2, pp. 1425 and 1426.
- 25 and 26. Abstracted in THE JOURNAL, May 16, p. 1581.
- 27 and 28. Abstracted in THE JOURNAL, May 9, pp. 1501 and 1500.

Archives of Diagnosis, New York

July, VII, No. 3, pp. 201-300

- 30 Diagnosis of Abnormalities of Myocardial Function. T. S. Hart, New York.
- 31 *Some of Newer Methods of Diagnosis in Heart Affections. T. E. Satterthwaite, New York.
- 32 Respiration in Heart Disease. M. Herz, Vienna.
- 33 Relation of High Systolic to Diastolic Pressure. J. H. Musser, Jr., Philadelphia.
- 34 Acromial Respiratory Sounds. J. H. Barach, Pittsburgh.
- 35 *Percussion Sign for Detecting Fluid in Pleura. L. S. Mace, San Francisco.
- 36 Clinical Features of Abdominal Pain and Tenderness. C. A. Elsborg, New York.
- 37 Seven Cases of Cutaneous Sarcoma. H. Fox, New York.
- 38 Primary Family Splenohepatomegaly (Gaucher Type). H. B. Sheffield, New York.
- 39 Diagnosis of Carcinoma. M. Kahn, New York.

31. **Diagnosis of Heart Affections.**—The importance of Sahli's announcement of the discovery of his band in 1885 is emphasized by Satterthwaite. The band consists of a wreath of dilated reddish colored venous radicles, usually from 1 to 2 inches wide, disposed in somewhat vertical and parallel lines, though dendritic in appearance. It forms a semicircle on the left side of the thorax over the lower ribs, its center corresponding to the nipple, below which it runs at a distance of several inches. It may escape notice unless one examines the skin closely, for sometimes it is narrow, the radicles are minute, or it is imperfectly developed. It is said to have been noticed in thoracic aneurism and mediastinal tumors, but its significance has not yet been established. Judging from analogy, however, Satterthwaite believes that some intrathoracic deposit of a fibroid material has taken place, as in adhesive pericarditis, calling for a collateral circulation. It is of the same nature as the caput medusae seen over the anterior abdominal wall in cirrhosis of the liver.

35. **Fluid in Pleura.**—This sign is produced by placing the pleximeter finger as near as possible at the base of the spinous process of the vertebra on a level with the suspected fluid and on the side opposite to it, and percussing diagonally through the body of the vertebra in the axis of the opposite lung. If fluid is present the resulting note will be flat. If no fluid is present and the lung is consolidated or normal, the resulting note will be dull or resonant but not flat. If the process is reversed, and diagonal percussion made through

the body of the same vertebra toward a normal or consolidated lung opposite the fluid, the resulting note will be resonant or dull but not flat. This method differs fundamentally from the usual method of spinal percussion, viz., percussing directly over the spinous process in the axis of the center of the vertebral body. This gives a mixed note depending on the condition of the organs on both sides of the spinal column. The method of diagonal percussion described by Mace gives in the same vertebra notes characteristic of the lung toward which the percussion is directed.

Archives of Internal Medicine, Chicago

August 15, XIV, No. 2, pp. 145-288.

- 40 *Pathology of the Spleen. J. H. King, Baltimore.
- 41 *Influence of High-Calory Diet on the Respiratory Exchanges in Typhoid. W. Coleman and E. F. DuBois, New York.
- 42 Study of Twenty-Nine Cases of Advanced Pulmonary Tuberculosis Treated by Artificial Pneumothorax. L. Kessel and M. Taschman, New York.
- 43 *Studies on Acidosis and Dyspnea in Renal and Cardiac Disease. F. W. Peabody, Boston.
- 44 *Clinical and Metabolism Studies in a Case of Myotonia Congenita—Thomsen's Disease. J. Rosenbloom and B. A. Cohoe, Pittsburgh.
- 45 Case of Aplastic Anemia. J. H. Musser, Philadelphia.

40. **Pathology of the Spleen.**—Following splenectomy, King found that there occurs an increase in the total fats and cholesterol in the blood, and also a reduction in the value of the iodine number (that is, a lower iodine number). In clinical conditions associated with hemolysis, pernicious anemia, hemolytic jaundice, catarrhal jaundice and some forms of cirrhosis of the liver, there is found a decided increase in the value of the iodine number. There appears to be a parallelism between highly unsaturated fatty acids in the blood and hemolysis. The occurrence of these highly unsaturated fatty acids is intimately dependent on the activity of the spleen, for removal of that organ reduces the iodine-combining value of the unsaturated fatty acids and renders the production of icterus by hemolyzing agents more difficult. Also it greatly improves clinical conditions in which hemolysis is at work. This is interpreted to mean that the spleen may be the central point in many diseases in which hemolysis and anemia are active, especially in pernicious anemia. This organ may be conceived to take on an increased function as regards its hemolytic activities, resulting in hemolysis, anemia and icterus.

The condition of asplenism presents in some of its features a diametrically opposite picture. Animals in this condition are more resistant to hemolyzing agents, and icterus is much more difficult to produce. The increase in the total fats and lipoids following splenectomy may explain the increased resistance of the red blood-cells found to accompany the condition of asplenism. These substances have definite anti-hemolytic properties. In pernicious anemia, hemolytic jaundice, some types of catarrhal jaundice and cirrhosis of the liver, the hyperactive spleen unfavorably influences the anemia, through its regulation of the highly hemolytic unsaturated fatty acids in the blood. Its removal appears therefore to be indicated. Splenectomy of itself, besides influencing the hemolytic unsaturated fatty acids, raises the percentage of anti-hemolytic substances in the blood; that is, the total fats and cholesterol. King concludes that the fact that total removal of the spleen is not followed by any symptoms dangerous to the life of the patient has probably drawn attention away from the consideration that states of diminished function of this organ may exist.

41. **Influence of High-Calory Diet in Typhoid.**—The Benedict "universal respiration apparatus" employed by Coleman and DuBois in their investigation was tested on normal controls and found to give accurate results. They believe that the apparatus is well adapted to clinical use if Benedict's technic is carefully followed, that is to say, if precautions are taken to prevent leaks, and if results obtained on patients whose breathing is irregular or labored are discarded. Leaks lower the quotient, irregular and labored breathing artificially raise it. The metabolism of liberally fed typhoid patients exceeds that of normal individuals by from 36 to 40 per cent. Previous observers have found that the average basal meta-

bolism during the febrile period of patients who are on diets containing less energy than they produce is 35.3 calories per kilogram per day. Comparing this figure with the averages obtained, after ingestion of food, on typhoid patients who received from 35 to 170 calories per kilogram daily, it is observed that the average metabolism per kilogram of body-weight shows an increase of from 2 to 5 per cent. If the body-surface be made the basis of comparison, it is found that the increase is between 11 and 13 per cent.

Since the variation in the metabolism of different normal persons may amount to 10 per cent. above or 10 per cent. below the normal average, it is obvious that the influence of a large ingestion of food cannot be of great importance in increasing heat production in the febrile stage of the disease. In other words, the large amount of food administered exhibits little or no specific dynamic action, thus removing the chief theoretical objection to the use of liberal diet in typhoid fever. In the high-calory cases approximately 10 per cent. must be added to cover the increase in metabolism caused by bodily exertion incident to moving about the bed. Accordingly the typhoid patients examined had an average theoretical requirement of 38.5 calories per kilogram per day. It has been found, however, that the theoretical requirement must be exceeded by from 50 to 110 per cent. in order to bring the patient into nitrogen and weight equilibrium. The fate of the excess has not yet been discovered. In the steep-curve period and during relapses some patients derived from 84 to 89 per cent. of their calories from carbohydrate and, in addition, transformed some carbohydrate into body-fat. The majority of the high-calory patients showed a sharp rise in the level of the respiratory quotients during the last days of the fever, which we have interpreted to mean that the regenerative processes of convalescence begin before the temperature reaches normal.

43. **Acidosis and Dyspnea in Renal and Cardiac Disease.**—The mild grade of acidosis which is often associated with uncomplicated chronic nephritis, Peabody found, is compensated for by the increased excretion of acids by the kidney. It is only in uremia and usually only in very advanced uremia that non-volatile acids accumulate in the blood in an amount sufficient to cause depression of the tension of carbon dioxide in the alveolar air. In the terminal stage of uremia there may be a high grade of acidosis. Peabody claims that the development of acidosis bears little relation to the accumulation of non-protein nitrogen in the blood or to the output of phenolsulphonephthalein. Determinations of both of these may show extreme abnormalities before any marked degree of acidosis develops. The development of acidosis is not the direct or sole cause of dyspnea associated with cardiorenal disease. A high grade of acidosis may exist without causing a change in respiration which is evident on the ordinary clinical examination.

In some cases of cardiac disease accompanied by dyspnea there is evidence of a slight accumulation of non-volatile acids in the blood, in other cases there is no evidence of such an accumulation. The tension of the carbon dioxide in the alveolar air is normal or very slightly increased. The hydrogen-ion concentration of the blood remains normal. In neither group of cases is the degree of acidosis sufficient to account for the dyspnea on the basis of an increase in the stimulus to respiration alone. It seems probable to Peabody that an important factor in the causation of dyspnea in cardiac disease is an increase in the excitability of the respiratory center. Such a change in the excitability may well be caused by a lowering of the oxygen tension, and be dependent on an inadequate blood-flow.

44. **Clinical and Metabolism Studies in Myotonia Congenita.**—In a metabolism experiment of thirteen days' duration on a case of myotonia congenita, Rosenbloom and Cohoe found that the patient lost 20.02 gm. of nitrogen, while the urinary nitrogen partition (urea, ammonia, creatinin, uric acid and undetermined nitrogen) was normal in character. Creatin was absent from the urine except after the administration of 620 gm. of egg-yolk. In a period of ten days 0.9 gm. of sulphur was lost, while the urinary sulphur parti-

tion (total sulphates, ethereal sulphates, inorganic sulphates and neutral sulphur) is normal in character. In a period of ten days the patient had a positive phosphorus balance of 1.5 gm., showing that during a time of nitrogen loss, phosphorus was retained. The amount of earthy phosphates and total phosphates in the urine may be considered normal. In ten days 4.09 gm. of calcium oxid and 0.56 gm. of magnesium oxid were lost by this patient. A retention of phosphorus produced by feeding egg-yolk did not cause a retention of calcium. Evidence is produced to show that the loss of calcium may play a part in the production of the symptoms of myotonia congenita. The fact embolism was normal in character, with an absorption of about 90 or 91 per cent. of the ingested fat.

Arkansas Medical Society Journal, Little Rock

August, XI, No. 3, pp. 61-92

- 46 Anoci-Association. G. W. Crile, Cleveland.
47 Diagnosis and Treatment of Syphilis of Nervous System. L. Thompson and D. W. Roberts, Little Rock.

Boston Medical and Surgical Journal

August 20, No. 8, pp. 289-328

- 48 Function of Spleen with Particular Reference to Hemolysis and Hemolytic Anemias. H. C. Moffitt, San Francisco.
49 Ergotherapy in Treatment of Mental Disorders. E. C. Reid, San Francisco.
50 *Use of Section of Scapula in Correcting Nasal Deformity. O. A. Lothrop, Boston.
51 Syphilis of Nose. J. Prens, Boston.
August 27, No. 9, pp. 329-364
52 *Therapeutic Artificial Pneumothorax as Associate Treatment in Pulmonary Tuberculosis. J. A. Lyon, Rutland.
53 Functions of Dispensary or Out-Patient Department. M. M. Davis, Jr., Boston.
54 Analysis of One Hundred Cases Studied in Connection with Municipal Criminal Courts of Boston. V. V. Anderson, Boston.
55 Diagnosis and Treatment of Early Pulmonary Tuberculosis. J. B. Hawes, 2d, Boston.
56 Unusual Phases of Sigmoidoscopy. R. W. Jackson, Fall River.

50. Use of Section of Scapula in Correcting Nasal Deformity.—A strip of bone, 2 inches long and about $\frac{1}{2}$ of an inch wide was removed by Lothrop from the free vertebral border of the scapula with bone cutting forceps and wrapped in wet, sterile gauze. The attachments of the muscles were first cut from the border and from the external and internal surfaces, great care being taken not to denude the bone of its periosteal covering. A subdermal passageway was made in the nose bridge extending to the distal extremity of the nasal bones. At this point the periosteum of the nasal bones was cut and elevated along the crest of the nose bridge up to the frontal bone. The nasal bones were now ground down with a rasp. The graft was inserted through this passageway and under the periosteum until the end reached to the frontal bone. In three weeks the graft was quite solid and in four weeks it was very rigidly held in place on the nasal bones and the dressing was omitted.

52. Therapeutic Artificial Pneumothorax in Treatment of Pulmonary Tuberculosis.—Of the sixty-two patients treated by Lyon two were incipient ones, and treatment was given to relieve frequent hemoptysis. The lungs in both instances have been collapsed since April, 1913, and February, 1913, respectively. There has been no recurrence of the hemoptysis, and for the past several months, the sputum has been negative to tubercle bacilli. There were thirty-one cases in the moderately advanced stage of the disease, two in which the prognosis was questionable, seventeen unfavorable and twelve bad. In three instances the lung was collapsed to relieve hemorrhage and the experiment was successful. The treatment had to be discontinued with two of the patients on account of a recrudescence of the disease in the opposite lung. One developed a severe hemoptysis in the uncollapsed side and the treatment had to be abandoned. Four had to be discontinued on account of a recrudescence in the opposite lung, in one on account of neurosis, in three because Lyon was unable to introduce a sufficient amount of gas to expect any results. In two instances the treatment was abandoned on account of the occurrence of pleural shock, on both attempts to introduce gas the patient became unconscious.

The treatment was discontinued in still another case which developed appendicitis. One died following a spontaneous pneumothorax and the treatment was discontinued in another case on account of adhesions at the base of the opposite lung, causing marked dyspnea.

Of the fifteen remaining patients, five have been discharged and are doing well, three of this number are at present employed about the institution and are working eight hours per day. The treatment is being continued satisfactorily in the remaining ten cases, many of whom are soon to be discharged.

The greatest number of injections made in a given case was 28, the maximum amount given was 1,700 c.c. and the minimum amount was 50 c.c. with the exception of the patients suffering from pleural shock. Here, none was given. In the twenty-nine far advanced cases the prognosis was unfavorable in ten, and bad in nineteen. The treatment was discontinued in eight instances on account of recrudescence in the untreated side, four on account of neurosis, ten on account of dense unyielding pleural adhesions. One died of acute cardiac dilatation and pulmonary edema. Of the six remaining patients, one has been discharged as arrested and is working in the institution eight hours per day, three are progressing satisfactorily, the treatment was discontinued in another instance on account of pregnancy and the one remaining is a spontaneous pneumothorax and the collapsed lung has been maintained by occasional introductions of gas. The greatest number of injections with any one person was 20, the maximum amount introduced was 1,600 c.c., and the minimum amount was 50 c.c.

Of the sixty-two cases treated, fifty-eight were bilateral and four were unilateral. The treatment was discontinued in thirteen cases on account of dense unyielding pleural adhesions, and in twelve on account of recrudescence of the disease in the untreated side.

Bulletin of American Academy of Medicine, Easton, Pa.

August, XI, No. 4, pp. 181-264

- 57 Relation of Modern Medicine to Some Social Problems. J. L. Hefron, Syracuse, N. Y.
58 Relation of Medical Profession to Workmen's Compensation Acts in United States. F. L. van Sickle, Olyphant.

Colorado Medicine, Denver

August, XI, No. 8, pp. 283-326

- 59 Lumbar Puncture Serologic, Cytologic and Chemical Findings of Mental Disease. C. W. Thompson, Pueblo.
60 Eclampsia, Its Etiology and Treatment. C. A. Ferris, Denver.
61 Treatment of Puerperal Infection. A. R. Pollock, Monte Vista.
62 Transposition of Uterus and Bladder for Cure of Extensive Rectocele and Prolapsus of Uterus. C. H. Graves, Canon City.
63 Pla for Accurate Diagnosis in Lesions of Urinary Tract. T. L. Howard, Denver.
64 Treatment for Magnetic Foreign Bodies in Eye. W. H. Crisp, Denver.

Journal of Biological Chemistry, Baltimore

August, XI, No. 3, pp. 329-554

- 65 Comparison of Carbon-Dioxid Output of Nerve Fibers and Ganglia in Limulus. S. Tashiro and H. S. Adams, Chicago, and Woods Hole, Mass.
66 Biochemistry of Iodin. I. Distribution of Iodin in Plant and Animal Tissues. A. T. Cameron, Manitoba.
67 *Effect of Acute Destructive Lesions of the Liver on its Efficiency in the Reduction of the Ammonia Content of the Blood. C. H. Fiske, and H. T. Karsner, Cambridge, Mass.
68 Biochemistry of Purine Metabolism. I. Excretion of Purine Catabolites in the Urine of Marsupials, Rodents and Carnivora. A. Hunter, M. H. Givens and C. M. Guion, Ithaca, N. Y.
69 Allantoin. M. H. Givens, Ithaca, N. Y.
70 Organic Phosphoric Acid Compound of Wheat Bran. R. J. Anderson, Geneva, N. Y.
71 *Organic Phosphoric Acid Compound of Wheat Bran. III. Inositol Monophosphate. R. J. Anderson, Geneva, N. Y.
72 *Behavior of Sugar and Lactic Acid in the Blood Flowing from the Liver after Temporary Occlusion of the Hepatic Pedicle. J. J. R. MacLeod and A. M. Wedd, Cleveland.
73 On Sphingomyelin. P. A. Levene, New York.
74 Purification and Melting Points of Saturated Aliphatic Acids. P. A. Levene and C. J. West, New York.
75 Action of Tissues on Methyl Glucosides, Tetramethyl Glucosides and Natural Disaccharides. P. A. Levene and G. M. Meyer, New York.
76 Sphingosine. Oxidation of Sphingosine and Dihydrosphingosine. P. A. Levene and C. J. West, New York.

- 77 Parenteral Utilization of Disaccharid Sugars. A. G. Hogan, New Haven, Conn.
- 78 *Some Anaphylactic Reactions. H. C. Bradley and W. D. Sansum, Madison, Wis.
- 79 *Blood in Acidosis from the Quantitative Standpoint. W. M. Marriott, St. Louis.
- 80 Influence of Protein Intake on Formation of Uric Acid. A. E. Taylor and W. C. Rose, Philadelphia.
- 81 Uricolysis. A. E. Taylor and W. H. Adolph, Philadelphia.
- 82 Creatin and Creatinin. P. A. Shaffer, St. Louis.
- 83 Simplification of the Determination of Total Nitrogen by Calorimetry. A. Gulick, New York.
- 84 Comparative Biochemistry of Purine Metabolism. II. Excretion of Purine Catabolites in the Urine of Ungulates. A. Hunter and M. H. Givens, Ithaca, N. Y.
- 85 Cerebronic Acid. Constitution of Lignoceric Acid. P. A. Levene and C. J. West, New York.

67. Effect of Lesions on Hepatic Function.—Oxygenation of the perfusing fluid by pure oxygen instead of air renders more complete the reduction of the ammonia content of the fluid as it passes through the liver. Fiske and Karsner found no difference between normal livers and livers poisoned with the various toxic substances mentioned with respect to their ability to lower the ammonia content of the blood perfused through them.

71. Organic Phosphoric Acid Compound of Wheat Bran.—A previously unknown organic phosphoric acid, inosite monophosphate, $C_6H_{13}O_9P$, has been isolated by Anderson in beautiful crystalline form from wheat bran. All of the salts of this acid, with the exception of the lead salt, are very soluble in cold water. The alkaline earth salts are not precipitated with ammonium hydroxid, differing in this respect from other known organic phosphoric acids as well as from ordinary phosphoric acid.

72. Sugar and Lactic Acid in Blood.—The authors' experiments demonstrate that lactic acid is readily produced in the liver as a result of local stagnation of blood flow. This production of lactic acid, they believe, is probably dependent on the asphyxial condition which is induced, and it is very likely from glycogen that it is derived.

78. Some Anaphylactic Reactions.—Guinea-pigs sensitized to beef or dog hemoglobin fail to react, or react but slightly, to hemoglobins of other origins. The hemoglobins tried were dog, beef, cat, rabbit, rat, turtle, pig, horse, calf, goat, sheep, pigeon, chicken and man. The authors conclude that hemoglobins from different sources are chemically different. A low order of sensitization to isogenous proteins is found in guinea-pigs injected with guinea-pig tissue-proteins.

79. Acetone Substances in the Blood.—A revised technic for the determination of acetone bodies in small samples of blood is described by Marriott. He says that the blood of normal human subjects, and of dogs, pigs and cattle contains less than 1.5 mgm. of acetoacetic acid and less than 4 mgm. of butyric acid per 100 grams of blood, the results being expressed in terms of acetone. In acidosis the acetone bodies in the blood are higher than normal. The highest figure obtained was 28 mgm. of acetoacetic acid and 45 mgm. of oxybutyric acid per 10 grams of blood, expressed as acetone.

Journal-Lancet, Minneapolis

August 15, XXXIV, No. 16, pp. 425-450

- 86 Mayo Clinic Building at Rochester. R. O. Beard, Minneapolis.
- 87 Direct Laryngoscopy and Bronchoscopy. C. Kachelmacher, Fargo, N. D.
- 88 D'Arsonval Current in Treatment of Hypertension. C. W. Watson, Minneapolis.
- 89 Nervous Symptoms in Nephritis. E. H. Grove, Hetland, S. D.

Journal of Pharmacology and Experimental Therapeutics

July, V, No. 6, pp. 527-648

- 90 Action of Certain Drugs on Uterus of Guinea-Pig and of Rat. J. A. Gunn and J. W. C. Gunn, Oxford, England.
- 91 Effect on Respiration of Altered Vascular Conditions in Lungs. W. E. Dixon and F. Ransom, Cambridge, England.
- 92 Solubility of Lead Sulphid Ores and of Lead Sulphid in Human Gastric Juice. A. Woelfel and A. J. Carlson, Chicago.
- 93 Effects of Chloroform and of Ether Anesthesia on Protein Contents of Blood Serum of Rabbits. L. W. Buck, San Francisco.
- 94 *New Standard for Determination of Strength of Pituitary Extracts. G. B. Roth, Washington, D. C.
- 95 *Experiments on Cardiac Action of Camphor. O. H. Plant, Philadelphia.
- 96 *Efficiency of Knowlton-Starling Isolated Heart-Lung Preparation for Testing Cardiac Action of Drugs. O. H. Plant, Philadelphia.

- 97 Removal of Diffusible Substances from Circulating Blood of Living Animals by Dialysis. J. J. Abel, L. C. Rowntree and B. B. Turner, Baltimore.
- 98 Plasma Removal with Return of Corpuscles. J. J. Abel, L. G. Rowntree and B. B. Turner, Baltimore.

94. Strength of Pituitary Extracts.—The use of *B*-iminazolyethylamin hydrochlorid in 1 to 20,000,000 solution is suggested by Roth as a new standard for the determination of the activity of infundibular extracts when the isolated uterus of the virgin guinea-pig is used as the test organ.

95. Cardiac Action of Camphor.—Perfusion of the normal frog's heart with camphor failed to produce any constant effect which, Plant says, can be considered with certainty an evidence of stimulation. Application of a saturated solution of camphor to the exterior of a chloralized frog's heart caused marked but rather transient increase in rate of contraction. Ether solution applied in the same way had a similar though less marked effect.

The rate of contractions in isolated strips of normal ventricular muscle from the turtle's heart, was increased by moderate amounts of camphor in a majority of experiments. The amplitude of the contractions was not increased. Camphor was without effect in chloralized strips.

In the normal isolated dog's heart camphor failed to produce any distinct and constant stimulation; such effects as were observed were too slight and occurred too seldom to be attributed with certainty to stimulation by the drug. In chloralized dogs' hearts and in hearts that showed fatty degeneration from poisonous doses of phosphorus, camphor was without any beneficial effect. Taken as a whole the results of different series of experiments lead to the conclusion that camphor does not produce effects which entitled it to be regarded as a direct cardiac stimulant.

96. Testing Cardiac Action of Drugs.—The drugs tested by Plant were applied at the end of experiments in which camphor had been tested and usually after the heart had been isolated for two or four hours. Caffeine produced a moderate but very distinct degree of stimulation, evidenced by an increase in rate, in amplitude of contractions, in output per minute and a slight increase in the pressure of the blood in the arterial tube leading to the artificial resistance. There was apparently a direct relationship between the increased output and the increase in rate, since the output per beat was not materially changed during the period of stimulation by the caffeine; the relaxation of the heart was slightly less during this period.

Strophanthin caused a marked increase in output per minute and in amplitude of the contractions, and a moderate increase in the pressure in the arterial tube. Changes in rate were very slight, consisting in an increase of two to five beats per minute. The intra-auricular pressure as recorded by a water manometer connected with the inferior cava was decreased. The increase in efficiency of the heart under epinephrin produced a marked increase in the heart rate, in amplitude of contractions, in output and in arterial pressure; the pressure in right auricle was decreased. The effect was very striking but lasted only a short time.

Lancet-Clinic, Cincinnati

August 22, CXII, No. 8, pp. 197-224

- 99 Need for Whole-Time Health Officer. H. A. Cowing, Muncie, Ind.
- 100 Spasms. H. H. Hoppe, Cincinnati.
- 101 Hydrodipsia and Water Supply of Living Bodies. Z. C. McElroy, Zanesville.
- 102 Graduates of Medical Department of University of Pennsylvania Who Have Taught or Practiced in Cincinnati. A. G. Drury, Cincinnati.

Medical Record, New York

August 29, LXXXVI, No. 9, pp. 363-404

- 103 Intestinal Intoxication. H. Eppinger, Vienna, and J. Gutman, Brooklyn.
- 104 Sterilization of Mental Defectives from Physiologic Standpoint. A. W. Peters, Vineland, N. J.
- 105 Plea for More Rational Use of Vaccines. S. R. Blatteis, Brooklyn.
- 106 Radium in Treatment of Diseases of Ear. W. S. Bryant, New York.
- 107 Pellagra. J. R. Lowery, Raleigh, N. C.
- 108 Plea for More Care in Treatment of Follicular Tonsillitis. W. Lapat, New York.
- 109 Two Cases of Treatment by Radium Emanation. F. E. Park, Stoneham, Mass.

Modern Hospital, St. Louis

August, III, No. 2, pp. 69-140

- 110 Chicago-Winfield Tuberculosis Sanatorium. J. L. Anderson, Chicago.
111 Hospital Work of Labrador Mission. G. W. Corner, Baltimore.
112 New Hospital of House of Calvary. R. J. Reiley, New York.
113 Ward Waste and What Is Done with It. K. H. Van Norman, Baltimore.
114 Boom in Dispensary Work—Its Growth and Development. M. M. Davis, Jr., Boston.
115 New Children's Hospital at Los Angeles. M. L. Vannier, Los Angeles.
116 Artificial Illumination of Hospital Spaces. H. B. Wheeler, Chicago.

New Mexico Medical Journal, Las Cruces

August, XII, No. 5, pp. 127-153

- 117 Important Factors in Prognosis of Pulmonary Tuberculosis. J. S. Cipes, Albuquerque.
118 Tuberculin. D. C. Twichell, Silver City.

New York State Journal of Medicine

August 22, C, No. 8, pp. 349-396

- 119 *Practical Application of Luetin Test. H. Noguchi, New York.
120 Present Status of Complement Fixation Test in Diagnosis of Gonorrheal Infections. A. McNeil, New York.
121 Infantile Roots of Masochism. P. Federn, Vienna.
122 Adipose and Lipomatosis. G. E. Price, Philadelphia.
123 Medical and Bacteriologic Experiences During Late Balkan War. B. Jablons, New York.
124 Removal of Two Nails from Bronchi of Child Two Years Ago by Bronchoscopy. R. H. Good, Chicago.
125 Investigation of Gastric Neuroses with Vago Excitatory Characteristics. S. Neuhof, New York.
126 Functional Tests of Static Labyrinth in Neurologic Diagnosis. I. Friesner and A. Braun, New York.
127 *Modified Gastroduodenal Tube. M. E. Rehfuß, Philadelphia.

August 29, No. 9, pp. 397-448

- 128 General Paresis. D. M. Kaplan, New York.
129 *Digitalis in Chronic Diseases of Heart. L. F. Bishop, New York.
130 Surgical Treatment of Infantile Paralysis. J. W. Moore, Philadelphia.
131 Is Tuberculosis Crusade Becoming Burlesque? T. J. Mays, Philadelphia.
132 Roentgen Diagnosis in Fractures of Cranium in Children. G. Rosenbaum, Philadelphia.
133 Congenital Malformations of Rectum and Anus. M. R. Bookman, New York.
134 Injurious Effects of Light on Eyes. W. B. Lancaster, Boston.
135 *Placental Blood for Transfusion. G. Rubin, Chicago.
136 An Aid in Use of Allis Inhaler. P. A. Sheaff, Philadelphia.

119. **Practical Application of Luetin Test.**—Based on the observations made by about fifty investigators, the following statistical estimation of the practical value of the luetin reaction is presented by Noguchi:

Primary Syphilis.—The reaction is present in less than 30 per cent. of cases and the intensity of the reaction is usually very mild.

Secondary Syphilis.—The reaction was reported positive in 47 per cent. of 630 cases. The reaction is usually mild.

Tertiary Syphilis.—The reaction was found in about 80 per cent. of cases. The reaction is very severe in this stage of the disease (usually pustular form).

Congenital Syphilis.—The reaction was reported to occur in about 70 per cent. of cases. Brown, who made the largest series of tests, found it present in 93 per cent. of seventy-five cases studied. The reaction becomes more distinct after energetic treatment.

Syphilis of the Nervous System.—The reaction is less frequently present in acute syphilitic meningitis than in the parenchymatous affections, such as general paralysis and tabes, where it has been reported positive in about 60 per cent. of cases.

Visceral Syphilis.—The reaction is present in nearly 90 per cent. of cases, especially is it marked in the cases of aortic insufficiency.

With reference to the relation of the luetin reaction to the Wassermann reaction, all investigators agree on one point, viz., that the two reactions do not always run parallel in the same cases. Thus the luetin reaction may be absent when the Wassermann is strongly positive, or the reverse. Both reactions, however, are frequently found to occur in the same patient, especially in cases of congenital syphilis and general paralysis. This discrepancy is explained by Noguchi by the fact that the luetin reaction indicates the allergy and the Wassermann the presence of an active syphilitic process.

Moreover, is it not difficult to explain the reason why a patient in whom the Wassermann reaction was, by a recent energetic treatment, reduced to a negative, should respond more readily to the luetin reaction than before the foregoing treatment, and in this particular respect the luetin reaction is able to furnish the physician with a prognostic measure in a restricted sense. From the statistics of the luetin reaction it is seen that the Wassermann reaction is much more constant among the primary and secondary cases, as well as in general paralysis, but the reverse is the case in the chronic cases, especially in those under treatment.

127 **Gastroduodenal Tube.**—Rehfuß points out that with his modified gastroduodenal tube it is possible, following the technic described, not only to ascertain the whole cycle of gastric digestion, but to locate the presence of liquid rests, hypersecretion, stasis, by a method of insufflation and auscultation described above. It is possible to determine the end point in gastric digestion, by failure to aspirate material when the patient is placed in different positions; by the character of the samples obtained; by the character of the sound produced by insufflation and heard by auscultation; by lavage. A method of outlining the stomach on the principle of the stomach whistles, is possible.

129. Abstracted in THE JOURNAL, July 18, p. 270.

135. **Placental Blood for Transfusion.**—A patient with pernicious anemia received three intravenous injections of defibrinated blood, and one injection in the gluteal muscles, with remarkable results. Rubin's patient was a woman, aged 55 years, with a general history and blood-picture of a typical pernicious anemia. Red blood-cells, 1,100,000; poikilocytosis; megaloblasts; megalocytes; normoblasts; leukocytes, 6,500. She had frequent attacks of dyspnea and tachycardia. She received 6 ounces of defibrinated fresh placental blood, mixed with an equal amount of normal sodium chlorid solution, making a total of 12 ounces. This was injected through a vein in the flexure at the elbow, the blood being kept at about body temperature. The red blood-cells increased 400,000 in less than twenty-four hours. The patient showed signs of immediate improvement. There was no dyspnea nor tachycardia. A week later 16 ounces of blood in normal salt solution were again injected intravenously in the other arm, but after 10 ounces had run in, extravasation took place and blocked the vein, so the balance of 6 ounces was injected in the gluteal region. The red cells increased 200,000 within twenty-four hours. A third injection of 16 ounces of blood in normal salt was made a week later, increasing the red cells 500,000 in twenty-four hours. The patient's general condition improved even more than the blood.

New York State Journal of Medicine

August, XIV, No. 8, pp. 389-429

- 137 *Drop Heart—Heart of Congenital Asthenia. C. L. Greene, St. Paul, Minn.
138 Sporadic Cretinism. Study of Forty-One Cases. C. Herrman, New York.
139 Cavernous Sinus Thrombosis. Case Report. T. R. Pooley, New York.
140 Plea for Diabetic. D. C. Mariarta, Saratoga.
141 Diabetes and Metabolism. W. B. Vanderpoel, New York.
142 Conservatism in Operative Treatment of Simple Fractures. G. Woolsey, New York.
143 Need of More Accurate Knowledge in Diagnosis of Mastoiditis by General Practitioner. J. F. McCaw, Watertown.
144 Neglect of Laboratory Aids to Diagnosis. D. Wilson, Amsterdam.
145 Tuberculin as Prophylactic. H. Greeley, Brooklyn.
146 Vaccine Therapy, Theory and Application. W. C. Thro, New York.

137. **Drop Heart.**—Greene maintains that contrary to current belief both drop heart and its chronic dilatations are extremely common and, indeed, should logically be anticipated in view of our present knowledge of the musculature of such hearts.

They have been hitherto overlooked because of the natural tendency to accept as the normal a standard of measurements far in excess of the drop heart normal and a failure to apply the simplest of therapeutic tests.

Another cause of general oversight has been the absence of serious symptoms of incompensation, apart from dilatation, and the decided dominance of subjective manifestations.

In the absence of proper diagnostic tests, the subjective manifestations are in great measure indistinguishable from those of so-called neurasthenia and nervous dyspepsia, both of which in most instances are directly associated with chronic congenital asthenia and its visceroptoses.

The type of individual carrying congenital asthenia is easily recognizable and in itself at once suggest the presence of the asthenic for drop heart. Greene insists that diagnosis must be based on the basic stigmata, the decided changes wrought by rest, the administration of full therapeutic doses of some standard digitalis preparation and results of repeated careful percussion with modern technic and a full record of symptoms.

The use of digitalis as a test measure is not only justified but required not only for the recognition of masked dilations of drop heart, but for the silent enlargements of degenerative types as well.

The congenitally asthenic heart may initiate symptoms of the most varied character or intensify those originating in other visceroptotic organs or finding expression in the nervous system as a whole.

It is therefore a definite and important contributive factor in those morbid states underlying the greater part of our chronic invalidism.

A few full doses of digitalis, rest modified or absolute, the comparison of carefully determined outlines obtained by modern methods are simple and efficacious means of making a primary diagnosis.

Not all drop hearts are symptom producing nor do the stigmata of congenital asthenia in general mean necessarily that their possessors must be chronic invalids.

Greene believes that dilated drop hearts, while often borne by well nourished individuals without active symptoms, may play a large part in the actual initiation of neurasthenic and dyspeptic symptoms in victims of malnutrition or infections.

Northwest Medicine, Seattle

August, VI, No. 8, pp. 223-256

- 147 Autoserotherapy. E. A. Pierce, Portland, Ore.
- 148 Artificial Pneumothorax in Treatment of Pulmonary Tuberculosis. R. C. Matson, Portland, Ore.
- 149 Relation of Temperature to Incipient Tuberculosis. J. N. Alley, Lapwai, Ida.
- 150 Application of Several Orthopedic Principles to General Surgery. E. A. Rich, Tacoma.
- 151 Expert Testimony and Malpractice Suits. J. M. Semple, Spokane.
- 152 Affections of Eyes Caused by Sinus Infection. C. Seamann, Portland, Ore.
- 153 Impressions Received from Visit to Some Eastern Surgical Clinics. J. T. Mason, Seattle.

Ohio State Medical Journal, Columbus

August, X, No. 8, pp. 455-518

- 154 Efficiency of Radium in Surgery. R. Abbe, New York.
- 155 Health Activity by an Insurance Company; Its Work in Ohio. L. K. Frankel, New York.
- 156 Mastoid Complications. J. W. Murphy, Cincinnati.
- 157 *Prophylaxis of Ophthalmia Neonatorum. M. D. Stevenson, Akron.
- 158 Fractures of Skull. S. D. Foster, Toledo.
- 159 *Hydrophobia: Report of Case. With Autopsy Findings. H. H. Drysdale, Cleveland, and A. A. Johnston, Omaha.
- 160 Some Considerations after 13,000 Administrations of Nitrous Oxid. W. I. Jones, Columbus.

157. *Prophylaxis of Ophthalmia Neonatorum.*—Stevenson considers it advisable in the present stage of work for the prevention of blindness from babies' sore eyes, that the old idea among the public that it is always or nearly always gonorrheal in its origin, should be corrected. He urges that the laity should be taught the plain facts, that while a certain small percentage of cases of babies' sore eyes are caused by the gonococcus, the large majority of the cases are produced by the various ordinary forms of pus-producing germs that are likely to be found in any mother; and that the presence of babies' sore eyes does not necessarily imply any guilt or wrong on the part of either parent. So long as the disease is thought to be purely gonorrheal in its origin, there will be associated with its treatment and attempts at its prevention a great deal of unnecessary embarrassment to the family and the physician. If such a belief is prevalent the physician will naturally be afraid, in many families, to suggest the use of prophylaxis, fearing that it will be considered a reflection

on the character of the mother or father, parents also would be afraid to suggest, let alone insist on, the use of prophylaxis. As a not necessarily gonorrheal disease, its public discussion will be much easier, it will receive more respectful attention, and will not be considered a part of the present almost hysteric propaganda with regard to sex hygiene and other subjects that are sometimes too freely discussed.

159. *Hydrophobia.*—The patient whose case is cited by Drysdale and Johnston presented some very unusual symptoms. In the first place, there was absolutely no record or knowledge of a bite by a dog or other animal. Second most of the pain of which this patient complained was confined to his right arm and seemingly had its origin in a recent wound on the dorsal aspect of his second finger. Tetanus, however, was promptly eliminated; there was no evidence or suspicion of trismus, permanent rigidity, orthotonus, opisthotonus or emprosthotonus. A complete review of the history of the case, the nature of the spasms and the rapid progress of the malady was sufficient to show that the disturbance was in no manner related to hysteria. The functional symptom syndrome that prevailed, that is, hemianesthesia, etc., was undoubtedly the expression of his psychopathic constitution.

The reflexes were found to be much slower on the left side as compared to those on the right. The left cremasteric, left plantar and left conjunctival responses were extremely sluggish if not abolished. No clonus Babinski phenomena, Rombergism, or spasticity was elicited. His station and gait were correct. The entire left side of his body, including the face and head, was totally anesthetic, and severe pin prods over this area did not draw blood. The surface sensibility of the right side was slightly hyperesthetic. The line of demarcation between the two sensory conditions was as sharp as the point of a needle. The patient had full control of all bodily movements; the grasp of his hands was strong; the strength of his arms vigorous, and the power of both lower limbs were apparently unimpaired. During a part of their examination, he sat on the edge of his cot and appeared quite jovial and unconcerned.

He was asked if he desired a drink of water, and instantly the typical hydrophobia spasm of the muscle of deglutition and respiration appeared. The facial expression was horrible; the muscles of the neck seemed to stretch almost to the point of snapping, and his eyes presented a "hunted look." He became cyanotic; his mouth was widely opened, and the pulse became almost imperceptible. For a few moments, he struggled to catch his breath, but ultimately relaxed. In a very short time he was quite himself. His craving for water was terrible. His mother handed him a piece of cake which he promptly ate, with little, if any, difficulty. Unintentionally, the word "water" again happened to be mentioned, and again he was thrown into a spasm equally as severe as the one from which he had just emerged.

The patient's throat was carefully examined, and the fauces were found to be extremely congested. A wad of cotton attached to an applicator was inserted deep into the pharynx and no reflex resulted. As a final test, to exclude lysophobia, he was urged to try to relax and slowly swallow a little water. This he tried to do, closing his eyes as the glass of water was brought to his parched lips. Every mouthful was explosively expelled the moment it reached the fauces. The spasmodic seizures increased in frequency and severity. He would scream for water, but the very sight of it would precipitate violent spasms. He was able to drink a little milk and tea to within twenty-four hours of his death. He ultimately became delirious. In one attack, he violently drove his fist through the plaster on the wall, but at no time did he attempt to bite or bark. He succumbed from cardiac syncope, after three hours of almost constant convulsions and maniacal frenzy. A necropsy was performed eighteen hours after death. Sections were made from different pieces of the brain tissue, but no Negri bodies were found. A rabbit and guinea-pig were inoculated with this material. The former subdurally, the latter intramuscularly. The rabbit died the next day, evidently from mechanical injury in inoculation. The guinea-pig is still living.

A portion of the medulla was emulsified in glycerin. August 12, 0.3 c.c. of the glycerin emulsion was injected subdurally into a rabbit. No change was noted until exactly four weeks after, when the rabbit refused to eat. It was drowsy and would continually lie on its left side, it appeared thirsty and drank much water. The next day, its hind extremities were helpless, and when stimulated to move, would drag along and fall over on its left side, apparently exhausted. The next day, its forelimbs were also paralyzed. During the day the paralysis became complete. The breathing became rapid. Death occurred during the night. On examination, grossly nothing was found except a diffuse congestion of the pia mater. Microscopically, Negri bodies were found, also typical Von Gehuchten degeneration of the ganglia.

Ophthalmic Record, Chicago

- August, XXIII, No. 8, pp. 579-582
- 161 New Operation for Conical Cornea. F. B. Tiffany, Kansas City, Mo.
 - 162 Sympathetic Optic Neuritis or Transferred Papilloretinitis, Associated with Only Mild Serous Iridocyclitis. Report of Case. H. B. Dechard, Dallas, Tex.
 - 163 New Electric Ophthalmoscope. C. H. May, New York.
 - 164 Abraham Lincoln. Diagnosis of Heterophoria from Portrait and Diplopia. E. E. Holt, Portland, Me.
 - 165 Case of Relapsing Acute Iritis Apparently Cured by Use of Autogenous Vaccine. H. C. Parker, Indianapolis.

Pennsylvania Medical Journal, Athens

- August, XVII, No. 11, pp. 851-932
- 166 What Is the Purpose of Constitution and By-Laws of County Society? J. M. Burt, Erie.
 - 167 Diagnostic Problems of Upper Abdomen. D. Riesman, Philadelphia.
 - 168 Pneumonias of Childhood. C. K. Alger, Swarthmore.
 - 169 Not Faucial but Lingual Tonsil. W. A. Hirschler, Philadelphia.
 - 170 Relations of Nose, Throat and Mouth Conditions to Trifacial Neuralgia. G. M. Coates, Philadelphia.
 - 171 Relation of Medical Profession to Workmen's Compensation Acts in United States. F. L. van Sickle.
 - 172 Middle Turbinate as Factor in Headaches. J. A. Hagemann, Pittsburgh.
 - 173 Diphtheria. J. A. Doyle, Greenville.

Texas State Journal of Medicine, Fort Worth

- August, X, No. 4, pp. 147-178
- 174 Importance and Significance of Tears of Perineum and Cervix. E. D. Martin, New Orleans.
 - 175 Cancer of Uterus. J. E. Gilcrest, Gainesville.
 - 176 Some Difficulties Encountered in Making an Early Diagnosis of Cancer of Uterus. H. A. Barr, Beaumont.
 - 177 Carcinoma of Uterus. H. F. Connally, Waco.
 - 178 Cancer Quack; How Eliminate Him? J. H. Vaughan, Liberty Hill.
 - 179 High Cost of Roentgen Ray When You Use It; Higher Cost When You Do Not. G. D. Bond, Fort Worth.
 - 180 *New Supravaginal Plastic Hysterectomy. L. L. Shropshire, San Antonio.

180. New Supravaginal Plastic Hysterectomy.—This is the uterus-splitting operation with removal of a wedge-shaped piece from the center of the body of the uterus. After separating the bladder from the uterus down to the internal os, Shropshire clamps the uterus on either side from the insertion of the Fallopian tube to its center at the internal os with a specially devised hysterectomy clamp, and using it as a guide, transfixes the uterus at the points of the clamps with a long sharp-pointed knife, bringing the blade out of the fundus at the inner side of the clamp, making a smooth-cut surface; then by drawing the clamps together, he brings the two marginal-cut surfaces of the uterus into close apposition and puts in two rows of chromic gut sutures.

Vermont Medical Monthly, Burlington

- August, XX, No. 8, pp. 199-220
- 181 Concerning Communicable Diseases and their Management. W. P. Northrup, New York.
 - 182 Tonsils—Safeguard or Menace? J. M. Hamilton, Rutland.
 - 183 Surgical Obstetrics. J. M. Gile, Hanover, N. H.
 - 184 Aspects of High Blood-Pressure. C. M. Sneden, Littleton, N. H.
 - 185 Poliomyelitis. O. D. Eastman, Woodsville, N. H.

Wisconsin Medical Journal, Milwaukee

- August, XIII, No. 3, pp. 91-130
- 186 Osteitis Fibrosa Cystica. J. F. Smith, Wausau.
 - 187 Intranasal Treatment of Chronic Frontal Sinus Suppuration. W. E. Grove, Milwaukee.
 - 188 Extrascapular or Sliding Hernia. V. F. Marshall, Appleton.

- 189 Relation of Psychiatrist to Juvenile Court. A. M. Rogers, Milwaukee.
- 190 Surgical Aspect of Diseases Producing Peritonitis in Upper Abdomen. W. E. Fairfield, Green Bay.
- 191 Application of University Extension Methods to Certain Lines of Medical Practice. J. R. Taylor, Madison.
- 192 Cancer and Cancer Problem. W. E. Ground, Superior.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

- August 15, 11, No. 2798, pp. 321-348
- 1 Duty of State Toward Early Environment of Child. W. L. Mackenzie and T. Dewar.
 - 2 Eyes and Eyesight of Children. A. R. Galloway.
 - 3 Medical Certification Other than Under Lunacy Acts. C. Sandeman.
 - 4 *Serum Diagnosis of Pregnancy and of Cancer. A. Leitch.

3. Serum Diagnosis of Pregnancy and of Cancer.—The details of 100 cases examined by Leitch to test the method in the serum diagnosis of cancer are as follows: in the first set of experiments three different substrates were employed: (1) A large protuberant, non-ulcerated squamous-cell carcinoma of the scalp, extremely cellular, with fine supporting fibrous-tissue trabeculae, the tumor being easily washed free of blood and being almost dead white; (2) a cellular spheroidal-cell carcinoma of the breast with a minimal amount of stroma; (3) placenta.

The 9 cancer serums all gave positive results with the epitheliomatous tissue—if anything, more markedly in the case of squamous cell than in other carcinomata—whereas the 12 non-cancerous cases were negative with the exception of a case of lipoma. The mammary cancer was not such a good substrate. It did not give as good results with the mammary cancer cases as did the epithelioma. With it 5 cancer serums were tested; 3 gave positive reactions, 2 were absolutely negative; of 5 non-cancer cases, 4 were negative, 1 was positive. With placenta, 8 cancer serums were tested, 7 gave positive reactions, 1 was negative; of the 7 non-pregnant, non-malignant cases 1 was positive. In all cases the serums were used fresh.

In another series the serums were tested simultaneously against four different cancers: (1) a carcinoma of the breast; (2) an epithelioma of the cervix which it was impossible to free from blood; (3) a protuberant epithelioma of the vulva; (4) an epithelioma of the tongue. With the mammary carcinoma substrate only 4 cancer serums out of 12 gave positive results, and all 3 non-malignant cases were positive; with the uterine cancer substrate 9 cancer serums out of 12 gave positive results, and 1 of the 3 non-malignant cases was positive; with the vulvar cancer substrate 4 cancer serums out of 12 were positive, and of the non-malignant cases 1 was positive; with the lingual cancer substrate 2 of the 12 cancer serums gave positive results, and of the non-malignant cases 1 was positive. The mammary cancer substrate only succeeded in picking out 1 of the 6 cases of mammary carcinoma, the uterine cancer substrate picked out 2 of 3 cases of uterine cancer, and the vulvar cancer substrate picked out the case of vulvar cancer.

Of the 100 cases tested by Leitch to prove the worth of the method in the serum diagnosis of cancer, 51 were cancer and 49 were non-malignant. In the 51 cancer cases positive results were obtained in 28, that is, 55 per cent.; and in the 49 non-cancerous controls positive results were obtained in 18, that is, 37 per cent. In Leitch's opinion, therefore, the method is without diagnostic value.

The conclusions to which Leitch has come after a careful investigation of Abderhalden's dialysation method are that the real fallacies of the technic are beyond control, and that the hypothetical fallacies which Abderhalden invokes to account for false reactions have no bases. Positive results are quite well accounted for by the facts that "substrates" alone, and the serums alone, give diffusible substances reacting with ninhydrin; that the dialysers vary enormously in

the quantities of such substances which they allow to pass in a given time; that serums, influenced by the distilled water and by the presence of a tissue acting in virtue of its physical state, are progressively cleaved; and that it is not the substrate which is split by the serum so much as the serum which is split by the substrate. These real fallacies quite destroy the value of the method, and they cast grave doubts on the whole theory.

As to the value of the method in pregnancy, Leitch states that he may have been unconsciously generous to an attractive theory in his reading of the reactions, but he does not attach much weight to that explanation. It may be that pregnant serum more commonly possesses the property of being split up when some suitable physical accessory is added such as placental tissue. But what seems more probable is that there exists in serum, more frequently, though not exclusively, in pregnancy, a general proteolytic and peptolytic power which we can demonstrate by adding a suitable, though not necessarily a specific protein or peptone. The serum of the normal guinea-pig is generally credited with a fairly strong proteolytic power. Leitch tested the action of several guinea-pig serums on egg albumen, coagulated cancer tissue, human blood-clot, and human placenta, and it happened that only with the latter were strong reactions evident. That seems to show that placenta protein is a suitable substrate for the demonstration of a general proteolytic power.

Journal of Laryngology, Rhinology and Otology, London

August, XXIX, No. 8, pp. 393-448

- 4 Suspension Laryngoscopy and Its Practical Use. G. Killian.
- 5 Case of Paralysis of External Rectus Muscle Due to Presence of an Abscess in Apex of Petrous Pyramid. Death from Basal Meningitis. G. Wilkinson.
- 6 Bisubmucous Resection of Septum Nasi. J. van der H. Leonhard.

Journal of State Medicine, London

August, XXII, No. 8, pp. 449-512

- 7 Germ Carriers. L. Vaillard.
- 8 Rise and Progress of Factory Legislation. T. Oliver.
- 9 Work of the Metropolitan of Paris. L. Biette.

Journal of Tropical Medicine and Hygiene, London

August 1, XVII, No. 15, pp. 225-240

- 10 Coastal Climate of Tropical Queensland. F. H. Taylor and W. J. Young.
- 11 Entamebiasis. L. B. Keng.

Lancet, London

August 15, II, No. 4746, pp. 435-480

- 12 Heredity. W. Bateson.
- 13 Congenital Atresia of Postnasal Orifice. C. W. Richardson.
- 14 *Pregnancy Complicated by Severe Morbus Cordis: Two Cases Treated by Hysterotomy Under Spinal Anesthesia. J. B. Banister.
- 15 Gun Deafness and Its Prevention. J. Horne.

14. **Pregnancy Complicated by Severe Morbus Cordis.**—Banister cites two cases treated by hysterotomy under spinal anesthesia. Case 1.—The patient, a primagravida, aged 21, four months pregnant, had two years previously had a severe attack of rheumatic fever, subsequent to which she developed a mitral stenosis. She had been unwell since the sixth week of pregnancy. There had been very severe vomiting, coupled with dyspnea and edema. She had been kept at rest and treated by the usual cardiac tonics, but reaction had been unsatisfactory. When Banister saw her she was cyanosed and dyspneic, her pulse was 124 and irregular, with the galloping rhythm characteristic of marked failure of compensation. Her temperature was 101.6° F. Examination revealed a normal four months pregnant uterus. The heart was markedly dilated, weak irregular sound with no definite murmur to be heard, but a definite thrill over the whole precordium. There were moist sounds over both lungs, and the base on either side was dull as far as the angle of the scapula. There was no sign of free fluid in the abdomen, but the back and the legs as far as the knees were edematous. As the patient was in a desperate state, had not responded to medical treatment, and was further handicapped by the continued vomiting, it was at once decided to empty the

uterus, and as her general condition precluded any inhalation anesthesia it was thought that the spinal method should be adopted. Accordingly, using Barker's heavy solution of stovaine, Banister produced anesthesia in this way and emptied the uterus by vaginal hysterotomy. The operation was easy of accomplishment and was carried out fairly rapidly without the patient showing any sign of shock. The bleeding was trifling. Unfortunately, the edema of the lungs progressed and she died the next day.

Case 2.—The patient, a 5-gravida, had had attacks of failure of compensation with the last three pregnancies, and extremely trying confinements, and came up in the fifth month of the present pregnancy in a condition of marked severity. The face was cyanosed, breathing was only comfortable when she was sitting up, and she had a distressing cough. The pulse was 118, weak and irregular; temperature 97.6° F. The apex beat was in the seventh space $4\frac{1}{2}$ inches from the mid-sternum, and the heart sounds were weak and flapping in character. There was no murmur. During the next three and a half months she was three times admitted in the same condition but improved under treatment. A week before term she was in a very distressed condition. The symptoms of cardiac failure were all very marked. Banister decided on cesarean section under spinal anesthesia for the following reasons: (1) cesarean section was the quickest method of delivery and the one which would throw least strain on her already enfeebled heart; (2) sterilization could be carried out and further risks of child-bearing avoided; and (3) as her cardiac condition seemed to be one of general myocardial degeneration, a general anesthetic was absolutely contra-indicated. She stood the operation extremely well. The patient got up on the fourteenth day, and left the hospital on the twentieth with her baby, both in good health.

Annales de Médecine, Paris

May, I, No. 5, pp. 469-592

- 16 *Familial Transient Paralysis of Legs Encountered in Northwestern France. E. Lenoble.
- 17 *Paroxysmal Form of Absolutely Irregular Heart Action. (La forme paroxystique de l'arythmie complète.) J. Heitz.
- 18 *Case of Mutilating Disease of the Legs. G. Guillaud and J. Dubois.
- 19 The Thresholds of Renal Secretion. (Signification du terme de seuil de sécrétion.) L. Ambard.

16. **Transient Recurring Paralysis of the Legs.**—Lenoble has encountered six cases in two families and in these alone in ten years of practice in Bretagne. There is evidently some organic lesion of the anterior horns of a certain segment of the lumbar spinal cord and nerve roots. He knows of nothing on record that compares with it, except what is called familial spasmodic dorsal tabes. The segment involved seems to undergo a senile degeneration, presumably from overuse. The paralysis of the extensor muscles comes on suddenly, in one leg at a time, with formication and sense of coldness. First one and then the other leg may be attacked, and the paralysis or impotence of the leg may be more or less pronounced but it passes off in a few weeks or months. The mildness of the phenomena and the pains in the legs suggesting sciatica are special features of the syndrome. The first attack came on at 25, 28 and 32 in one family and at 18, 20 and 24 in the other; all the patients were otherwise robust.

17. **Paroxysmal Absolutely Irregular Heart Action.**—Heitz gives a detailed history of ten cases of complete arrhythmia occurring in paroxysms with or without valvular lesions and with or without high blood-pressure. The paroxysms may develop in connection with some overwork or intoxication or some infection that has touched the myocardium, or even without apparent cause. Such patients are generally neuro-pathic, subject to gastro-intestinal derangements, and sometimes presenting the stigmata of hysteria. Excessive thyroid functioning seemed to be an additional factor in some cases. The heart is generally enlarged and there are signs of arteriosclerosis and of habitual overexcitability of the auricular myocardium entailing fibrillation. The paroxysms may come on with intense palpitations, dyspnea, distress, vasomotor disturbances, swallowing of air and more or less pronounced reduction of the capacity of the heart to do its

work. Attacks of this kind generally last from six hours to five days, and recur at intervals of one to three months. In other cases the paroxysms are much briefer and milder but the intervals are shorter. As a rule the attacks lengthen and the intervals grow shorter in time until finally the absolute irregularity becomes continuous. One patient has had attacks of these paroxysms every two months for nine years. They last six to twenty-four hours but the ordinary rhythm outside of the paroxysms is still normal at the age of 65. Digitalis prolongs and may even bring on the attacks; it is contra-indicated therefore unless there is asystole. Drugs and other measures to soothe the nervous system and tranquillize the patient are the main reliance, supplemented possibly by local applications over the heart region, ice-bags, cloths wrung out of hot water or bags of hot sand. In the intervals the heart should be supervised, with special care for hygiene and diet. When the arrhythmia has become permanent, digitalis may be systematically given to advantage. Morphine should be avoided and the patient reassured that the trouble is purely nervous and functional and will pass off without leaving any traces.

18. **Mutilating Affection of the Feet and Legs.**—The patient was a gardener of 54, apparently free from inherited or acquired taint. In 1905 he cut his heel on a piece of glass and ulceration and trophic disturbances followed, finally compelling amputation of the foot. Seventeen months later intense pains developed in the limb and further trophic ulceration. The other leg soon shared also in the mutilating affection. The differential diagnosis by exclusion was an ascending neuritis entailing secondary reactions in the meninges and spinal cord, possibly drifting into syringomyelia. The Argyll Robertson sign is positive but there are no other indications of syphilis.

Archives Générales de Chirurgie, Paris

July, VIII, No. 7, pp. 769-896

20 *Malignant Transformation of Dermoid Cysts in the Ovary. C. V. de Lapouge.

21 *Tuberculosis of the Clavicle. A. Martin.

22 Fascia Patch to Cure Hernia of Muscle. (Traitement des hernies musculaires par la greffe aponévrotique.) P. Maclaure.

20. **Malignant Transformation of Dermoid Cysts in the Ovary.**—De Lapouge reports three cases of cancer in a dermoid cyst of the ovary and summarizes from the literature forty others, adding that several were of dermoid origin in Stroganova's twenty-two cases of cancerous degeneration of ovarian cysts (*Russky Vrach*, 1913). The presence of the cyst was known for many years in a number of cases before the malignant transformation took place, twenty-six years in one case. But when cancer is once installed it seems to run a rapid course, death following in six months at longest. The malignant transformation had progressed so far in the cases on record before operative treatment was applied that no instance of complete recovery is known. Intervention merely prolonged life a few weeks or months except in one of Tédénat's three cases in which the patient survived for seven years. Dermoid cysts, as a rule, do not manifest their presence until between 20 and 35, and then they are generally removed before there is a chance for malignant transformation. Even allowing for this there are over sixty cases on record of cancer in a dermoid cyst of the ovary. Pommier has reported a case with 4 dermoid cysts, one in the right and three in the left ovary, and two in this group developed cancer. When it has once spread beyond the walls of the cyst, irreparable damage is soon done.

21. **Tuberculosis of the Clavicle.**—Martin states that he knows of no instance of a tuberculous process in the clavicle of a child. The majority of those affected are comparatively young and have a history of tuberculous glandular processes or otorrhea. In one case the process occurred in the clavicle in a young man with inherited syphilis. None of the patients had certain pulmonary tuberculosis but some were regarded as "suspects." Four cases are illustrated, showing that either end of the shaft may be involved. If the latter, the findings are similar to those of spina ventosa in other bones.

Archives Générales de Médecine, Paris

July, XCIII, No. 7, pp. 581-672

23 Dilating and Speculating Cannula for Subglottic Laryngo-Tracheal Stenosis. L. Dufourmentel.

24 *Results of Sanatorium Treatment of Pulmonary Tuberculosis in Various Countries. (Tuberculose et sanatoriums populaires.) G. Artaud.

24. **Pulmonary Tuberculosis and Sanatorium Treatment.**—Artaud compares the statistics from nine countries of Europe during the years 1906 and 1910, comparing the figures for the death-rate and the results of sanatorium treatment, especially in Germany, Switzerland and France. His conclusions are that at least 50 and probably 75 per cent. of all in the early stages of tuberculosis can be permanently cured by the system of public sanatoriums and dispensaries. The main point is to discover the tuberculosis in its incipient stages, when it is always curable. The average stay in the sanatorium should not be less than six months; it is from the sanatorium alone that we can expect actual and durable cures. The tuberculous taking fresh-air treatment at home generally get too much medicine; the family think that drugging is the chief factor in all treatment of the sick. The result in this case is that the digestion gets upset, and when the tuberculous lose appetite and cease to be properly nourished, the downward course is rapid. The family, besides, is seldom skilled enough to ward off further contagion.

Archives Mens. d'Obstét. et de Gynéc., Paris

July, III, No. 7, pp. 1-48

25 *Congenital Tuberculosis. W. Möller.

26 *Total or Subtotal Hysterectomy? (Evidement systématique du moignon cervical dans l'hystérectomie subtotale.) De Rouville.

27 Dermographism of Pregnancy. H. Treub.

25. **Congenital Tuberculosis.**—Möller declares that we have no right to assume congenital tuberculosis in any case unless the child dies from it in the first or second week after birth and characteristic lesions are found in it, with tubercle bacilli. Analysis of the cases published as congenital tuberculosis shows that only about a half dozen conform to those conditions. He adds another to this group, the child dying two days after birth and showing lesions of pronounced and typical tuberculosis, with numerous tubercle bacilli. The location of the lesions corresponded to a primary infection of the intestinal tract, spreading by the lymphatics to the regional lymph-glands and from here penetrating at some point into the blood. Recent tuberculous lesions were found in the decidua membrane and panhysterectomy was done. Old tuberculous processes were evident in both tubes, and to these Möller traces the infection of the uterus and of the fetus. When the woman was delivered there was no suspicion of tuberculosis and the placenta was not examined.

26. **Technic for Hysterectomy.**—De Rouville declares that he is a "subtotalist," that is, in removing the uterus he amputates it above the cervix, and he here expatiates on the various advantages of this technic. After the amputation he cuts out with the bistoury the inside of the cervix stump, leaving only a shell a few millimeters thick. The stump is then sutured and peritoneum drawn down to cover it. This leaving merely the shell of the cervix thus links the total and subtotal technics, he declares, with the advantages of each and none of the disadvantages. The vagina is not opened, and thus danger of infection is avoided and there is no tendency to hemorrhage from the vaginal culdesacs, while the weight-bearing apparatus is left intact. Removing the inside of the cervix does away with the possibility of new growths in the cervical mucosa, and if such should develop in the shell left, they can be easily inspected and removed.

Revue de Gynécologie, Paris

May, XXII, No. 5, pp. 369-464

28 *Mobilization of Rectum in Repair of Complete Rupture of the Perineum. (Périnéorrhaphie pour rupture complète du périnée avec ou sans déchirure de la cloison.) S. Pozzi.

29 *Repair of Severed Ureter. (Ureterorrhaphie dans les sections totales de l'uretère.) P. Sejourner.

30 Spa Treatment and Gynecology. (Traitement hydro-minéral des maladies des femmes.) S. Pozzi.

31 Fibroma in Broad Ligament Accompanying Fibroma in Uterus. X. Bender.

28. **Repair of Perineum Torn Completely Across.**—Pozzi here describes with twelve illustrations the various steps of perineorrhaphy for complete laceration, according to the technic which he has been using for over twenty-five years and with constant satisfaction even in extremely serious cases. He loosens up the anterior wall of the rectum until it is free so that he can draw it down far enough to bring outside the part corresponding to the damaged perineum. By this means there is no suture in the rectal wall except where it joins the anus. This avoids the danger of infection from an intrarectal suture with eventual fistula. The transverse incision in the rectovaginal wall is made in such a way that a small edge of vaginal mucosa is left below the incision; this is a great help in restoring the anus. The incision is carried deep enough to expose the anterior aspect of the rectum. He never found it necessary to open the pouch of Douglas; it can easily be pushed aside by keeping close to the wall of the rectum. He has never had a failure with this technic, and has found it of great service also in rectovaginal fistulas of all heights, first cutting the perineum entirely across to produce conditions similar to those of complete rupture. If there is cicatricial shriveling later, rendering the anus too small, a posterior rectotomy answers every purpose. It is by no means a difficult matter to slit the rectovaginal wall in this way, separating the fibers by working in between them until the orifice of the rectum and of the vagina no longer stand parallel to each other, and can be slipped past each other like bureau drawers. Pozzi illustrates casts made from four quite complicated cases treated in this way thirteen or fourteen years ago, the outcome in all confirming the ease and simplicity and importance of this technic and the fine results and continence attained, and claims priority for the principles involved. He unites the muscles directly by a deep isolated suture, using catgut, and utilizing even mere scraps of the muscles, especially those connected with the sphincter. After this is done he passes two or three double silver wires through all the soft parts just above and crossing the suture of the muscles. The traction on the primary incision has transformed it from a transverse to a vertical incision; this is sutured and the anus restored by suturing the skin to the lower margin of the drawn down rectum, edging the anus, if possible, with a narrow border formed of vaginal mucosa. When all this is done the wires are tightened and tied over rolls of gauze outside. As long ago as February, 1894, Pozzi declared that the lacerated wall should never be sutured directly but be restored by loosening and drawing down the rectum.

29. **Suture of Severed Ureter.**—Sejournet summarizes from the literature seventy-four cases of ureterorrhaphy after complete section of the ureter, classifying them according to the technic applied. The results were better the more perfect the coaptation of the stumps. End-to-end suture is less liable to be followed by stenosis than suture by invagination. The suture should be protected with a small flap, possibly of omentum. The experiences related warn that a large flap of tissue usually shrivels so much that the fibrous retraction may lead to stenosis. It is prudent but not indispensable to leave a small drain or wick. Oozing of urine is generally transient and stops spontaneously but seems to leave a tendency to stenosis later.

Semaine Médicale, Paris

July 29, XXXIV, No. 30, pp. 349-360

- 32 *Drainage in Empyema. (Le soin ultérieur des pleurotomisés.) R. de Bovis.
33 "Undescended Cecum." (L'ectopie haute du cæcum et de l'appendice et son importance clinique et opératoire.) F. Lejars.

32. **After Evacuation of Empyema.**—De Bovis compares the different methods in vogue for draining after evacuation of empyema, his conclusion being that there is no need to dread the entrance of air as such a serious matter as some claim. Drains and siphons and rubber bulbs and all air-tight procedures can be dispensed with as a rule in treating simple benign empyema. By leaving the low wound open, without tubes or tampons, pus and false membranes escape and the absence of any foreign body leaves a free field to

Nature to heal unmolested. This in itself is the best of all protections against ascending infection. The indispensable condition for this, however, is that the opening for evacuation of the empyema has been made ample enough, and that it was made at the exact point where gravity will prove most effectual to drain the pleura. To ensure these conditions it is necessary to resect a rib and to make the opening for the spontaneous draining at the lowest point of the slope, bearing in mind the patient's position in bed after the operation and during convalescence and whether the empyema is partial or total. He does not hesitate to close the incision and make a new one lower down if the first does not answer the purpose perfectly. He emphasizes further that the mobilization of the chest wall by the resection of a rib permits it to fall in under the pressure of the air so that, outside of the periods of inspiration, it shuts down air-tight over the convexity of the diaphragm and restricts if it does not prevent altogether the inflow of air. Air and microbes are also filtered and kept out more or less effectually by the dressings. As an operation for empyema is generally an emergency operation, the simplification of the procedure and of the after-care is a great gain. De Bovis does not believe that such large openings are necessary as Brinkmann advocates, and his experience with aspiration drainage has shown numerous disadvantages from it. He has applied the technic mentioned above in three cases and has been impressed with the prompt and complete recovery in from three to five weeks (except in the one case of tuberculous origin).

Beiträge zur klinischen Chirurgie, Tübingen

May, XCI, No. 3, pp. 403-718

- 34 *Epinephrin Content of Adrenals Is Markedly Reduced during Peritonitis. (Adrenalinhalt der Nebennieren bei akuten Infektionen.) Reich and Beresnegowski.
35 Treatment of Phlegmons on the Hand. M. Tiegel.
36 *Extensive Retrorenal Hemorrhage. (Zur Kenntnis der Massenblutungen ins Nierenlager.) Baggerd.
37 Curving Osteotomy for Crippled Knee. (Bogenförmige Osteotomie bei Winkelankylosen und arthrogenen Kontrakturen des Knies.) W. Schmidt.
38 Technic for Extensive Resection of the Thorax for Old Chronic Empyema. Peuckert.
39 Combination of Local Anesthetics with Potassium Sulphate Enhances Action of Some, Reduces It with Others. A. Hoffmann and M. Kochmann.
40 *Sunlight Plus Mountain Climate in Treatment of Tuberculosis of the Hand. (Erfolge der Heliotherapie im Hochgebirge.) A. Hüsey.
41 Temporary Resection of Roof of Mouth. (Temporäre Gaumenresektion.) Partsch.
42 Prothesis for Treatment of Cleft Palate. (Prothesenbehandlung der Gaumenspalten.) Riegner.
43 *Diagnosis of Nature and Location of Ileus. A. Tietze.
44 Pneumatosis of the Intestines. F. Neugebauer.
45 Villous Tumors of the Rectum; Two Cases. C. Goebel.
46 Technic for Closing the Pylorus Permanently with Duodenal Ulcer. A. Peiser.
47 Injections of Menthol-Eucalyptol in Prophylaxis and Treatment of Postoperative Bronchitis. Technau.
48 Serodiagnosis of Cancer. (Die Carcinomreaktion nach Abderhalden.) Fritsch.
49 Surgery of Peripheral Nerves. Borchard.
50 *Juvenile Deforming Osteoarthritis. G. Drähmann.
51 Gonorrheal Arthritis. C. Goebel.
52 Spontaneous Fracture after Periostitis from Overuse. Kolepke.
53 Negative Experimental Experiences in Regard to Regeneration of Periosteum. S. Weil.
54 Plugging Cavities in Bones with Pedunculated Muscle Flaps. (Plombierung von Knochenhöhlen durch gestielte Muskellappen.) R. Levy.
55 Electric Conductibility of the Urine in Diagnosis of Kidney Disease. (Verwertbarkeit der Leitfähigkeitsbestimmung des Urins in der Diagnostik der Nierenkrankheiten.) Renner.
56 Disadvantages of the Phenolsulphonephthalein Test; Not a Reliable Aid in Surgical Kidney Disease. K. Wröbel.
57 Tendency to Suffocation from the Thymus. (Thymusdrüse als Atemhindernis.) C. Ritter.
58 Technic for Avoiding Complications after Extensive Operations on the Chest. E. Jeger and J. Leland.
59 Technic for Suturing the Arch of the Aorta. E. Jeger and J. Leland.

34. **Epinephrin Content of Adrenals in Acute Infections.**—Reich and Beresnegowski report extensive experimental work and clinical investigation the results of which seem to indicate that the epinephrin content of the adrenals is very much below the normal proportion in more than half the cases of acute peritonitis. This lack of normal epinephrin content

readily explains the central vasomotor paralysis and weakness of the circulation which accompany acute peritonitis in man. Their research does not indicate that all acute infections affect the adrenal cortex so rapidly and injure it so severely as was evident in over 50 per cent. of the fatal peritonitis cases examined. This disease takes the lead in this respect. The findings in regard to the staining properties of the adrenal cortex are tabulated from 27 cases of acute peritonitis, 11 cases of chronic infections and 12 cases of acute infections not involving the peritoneum.

36. Perirenal Hemorrhage.—Baggerd reports a case of fatal spontaneous hemorrhage into the bed of the kidney. It proceeded from the kidney itself; in a previous case of extensive retrorenal hematoma the blood came from an adrenal. The typical symptoms of sudden intense pain in the kidney region, signs of severe internal hemorrhage and development of a tumor back of the kidney were pronounced in both cases. In these as also in a number of others on record there had been preceding milder attacks; Lenk's patient had nine in the course of three years. In Baggerd's case there had been attacks every six or eight weeks at first, each lasting two or three days; the intervals were free from pain. These attacks may have been due to preceding small hemorrhages in some cases, but in his case they were explained otherwise by a tendency to hydronephrosis kinking the ureter, and each time the attack had been preceded by a drinking bout, as also the last and most severe attack. The kidney was found floating in a pool of blood and the patient, a man of 44, never rallied after the nephrectomy. The mortality of perirenal hemorrhage is still high, 40 per cent., as the operation generally comes so late. The mortality was 100 per cent. in all the cases under conservative treatment alone. Various operative measures have been applied; the special procedure is not so important as prompt intervention to arrest the hemorrhage.

40. Tuberculosis of the Hand and Heliotherapy.—Hüssy tells remarkably favorable experiences with direct sunlight treatment of tuberculous processes in the hand and wrist, beseeching surgeons in particular to heed his words and refrain from operating in this class of cases and apply heliotherapy. He was assistant to Rollier, and gives the details of 32 cases. In 21 fistulas had already developed in the process in hand or wrist; in 29, lymph-glands were involved, and in 12 the lungs, while other local surgical tuberculous processes were evident in 25. The hand process healed completely under the systematic exposure to the mountain sunlight in 23 cases, and another patient was much improved. These patients have completed their course and left, the functional use of the hand is fully restored in nearly all. Eight others are still under treatment although the hand is entirely healed. In 17 of the 24 cured patients who have left Leysin all other tuberculous manifestations have been cured likewise, and in 5 they have materially improved. Three others have succumbed since to the progressive course of their multiple lesions but without return of the hand process. Heliotherapy, he emphasizes, must be applied only by physicians trained in orthopedic and surgical measures, applying the technic of each as needed, not leaving the entire task to the sunlight. Physicians at the head of tuberculosis institutions must in some way acquire the necessary surgical and orthopedic technic if they accept patients with surgical tuberculosis. The orthopedic side of treatment, punctures, proper position of the part affected, etc., are liable to be neglected when the institution is run by an internist. More use should be made in private practice of the curative action of direct sunlight. Surgical tuberculosis should be brought out of the sick-room into the light and air.

43. Ileus.—Tietze says that in 133 cases of ileus in which he has operated exaggerated peristalsis was pronounced in all cases except those in which peritonitis had already developed or the obstruction was not organic. Wahl declares that strangulation ileus and dynamic occlusion of the bowel both act alike on the peristalsis, paralyzing it. Tietze's

experience thus confirms Wahl's theory and shows further that feculent vomit sometimes accompanies septic paralysis of the bowel from peritonitis and must not be regarded as a sign only of mechanical ileus. The importance of distinguishing between paralysis of the bowel and mechanical obstruction he regards as so vital that he does not hesitate to say that in the former case an operation is a blunder—except when a fistula into the bowel is directly planned—while with mechanical obstruction an operation can be at worst merely hastening the almost inevitably required intervention. He classifies his material under various headings; 41 died of the 81 patients with mechanical ileus; 9 of the 35 with ileus from internal incarceration, volvulus or adhesions; none died of the 4 with torsion of the omentum, but 5 died of the 9 with ileus from necrosis of the pancreas—a total mortality of 42.1 per cent.

50. Juvenile Deforming Arthritis.—Drehmann has encountered nine cases of an affection of the head of the femur in children analogous to coxa vara in adolescents, only it is the reverse condition. Perthes found in similar cases that the surface of the head was flat instead of round and almost a groove had been hollowed out across the top. The cartilage is of normal structure and color and the bone itself seems of normal structure. Whether slight trauma or infection is involved is open to discussion, but there is no question that the deformity is the result of weight-bearing strain. The children affected are between 5 and 10; they begin to limp a little but do not complain of pain. The hip-joint can be used freely except that abduction, either passive or active, becomes impossible. There is no adduction as with coxa vara, but there may be a slight inward rotation. The limp suggests the gait with congenital dislocation. There is no trace of contracture as with an inflammatory process. The limping continues and there may be pain when fatigued, relieved by resting. There is no shortening of the limb as a rule, and after a few years the child ceases to limp and, except for more or less inability to abduct the limb, there is nothing left of the trouble.

Deutsches Archiv für klinische Medizin, Leipzig

CXVI, Nos. 1-2, pp. 1-200. Last indexed August 22, p. 713

- 60 Mixed Forms of Derangement of Kidney Functioning. (Zur Kenntnis der Nephropathien. III.) P. v. Monakow.
- 61 Effect of Small Doses of Toluylendiamin on the Blood; Experimental Polycythemia. (Entstehung experimenteller Hyperglobulie.) R. Hertz and M. Erlich.
- 62 Gasometric Determination of Urea, etc., in a Few Drops of Blood. (Zur Analyse sehr kleinen Stickstoffmengen in organischem Material.) R. Siebeck.
- 63 Murmurs in Arrhythmia of the Auricle. (Präystolische Geräusche bei Vorhofflimmern.) E. Weiser.
- 64 The Heart a Pressure Pump but Not a Suction Pump. (Zur Frage der Saugwirkung des Herzens.) A. Lehnndorff.
- 65 Variations in the Serum Concentration in Scarlet Fever. W. Kalser and J. Löwy.
- 66 Ammonia and Total Nitrogen Excretion in the Urine on Different Diets and Especially on a Rice Diet. Z. Tanji.
- 67 Proteus Meningitis and Proteus Sepsis in a New-Born Child; Bacillus Proteus as Cause of Disease in Man. F. Goebel.
- 68 The Function of the Kidney in Diabetes Insipidus. L. Lichtwitz and F. Stromeyer.
- 69 Total Metabolism and Albumin Metabolism in Patients with Carcinoma. E. Wallersteiner.

Deutsche medizinische Wochenschrift, Berlin

July 30, XL, No. 31, pp. 1553-1600

- 70 *Treatment of Acute Weak Heart Action. (Behandlung bedrohlicher Erscheinungen bei der Herzschwäche.) J. Grober.
- 71 Vaccine Therapy of Typhoid. R. Kraus and S. Mazza.
- 72 *Improved Technic for Serodiagnosis. (Kritik des Dialysierverfahrens und der Abwehrfermentreaktion.) H. Oeller and R. Stephan. (Neue Methode zum Nachweis der Abwehrfermente.) P. Hirsch.
- 73 Normal Sugar Content of Blood in Case of Addison's Disease. (Blutzucker bei Morbus Addisonii.) J. Broekmeyer.
- 74 *Fatal Hematoporphyria after Ten Grams of Sulphonal in Nine Days. (Letale Hematoporphyria nach Sulfonalgebrauch.) Pfortner.
- 75 *Periodical Arrhythmia. (Zur Kasuistik der periodischen Unregelmässigkeit des Pulses.) K. Rinderspacher.
- 76 *Pancreatitis—Complication of Mumps? N. Dracinski and J. Mehlmann.
- 77 *Acute Retention of Urine under Morphium. (Die akute Harnverhaltung eine wenig beachtete Wirkung des Morphins.) A. Czapek and S. Wassermann.

- 78 Roentgenotherapy of Tuberculous Lymph Glands. Kühlmann.
 79 Origin of Partial Antibodies. (Beziehungen der im Blut kreisenden Tuberkelbazillen zu der Entstehung von Partialantikörpern.) A. Mayer.
 80 *Access to Knee-Joint by Sawing the Patella Lengthwise. (Eröffnung des Kniegelenkes bei Meniscusverletzungen durch Längsschnitt mitten über die Patella und deren Durchsägung.) P. Babitzki.
 81 Preparation of Blood Platelets for Hemostasis in Operating on the Nose. (Das Coaguler: Kocher-Fonio in der Rhinochirurgie.) E. Barth.
 82 Refusal to Permit an Operation Considered from Standpoint of Workmen's Compensation Legislation. (Die Operationspflicht des Verletzten.) G. Puppe.

70. **Acute Weakness of the Heart.**—Grober comments on the diverse causes which may render the circulation inadequate. In nearly every instance death is the result of the heart's giving out. Acute overexertion is one of the most frequent causes of this and even a normal circulatory system may suffer severely from acute overexertion. The first thing in treatment is to relieve the heart of all the work possible; this is best accomplished by strict bed-rest. He thinks that the bed-rest is the most efficient factor in the "Karell cure." When the left ventricle is not working properly, the peripheral and pulmonary vessels become gorged with blood and great relief may be obtained from venesection. In one case he successfully repeated the venesection (500 c.c.) after an interval of three days. This is particularly useful with sudden and threatening cardiac asthma. Inhalation of oxygen may give great subjective relief, especially in chronic heart disease, but he does not ascribe any objective efficacy to it. The defective heart action may lead to transudation in the pleura, etc., and this hampers the heart action still further and immediate puncture may be indispensable. After tapping of ascites, a pleural effusion may be spontaneously absorbed. Or it may be advisable to drain away all the surplus fluid by several minute incisions 1 or 2 cm. deep in the dorsum of the foot. He has done this in several cases; the wound closed up spontaneously in a week or so.

Other means to influence transudation are to restrict intake of fluids and to stimulate diuresis. Calomel is very useful here but is contra-indicated on suspicion of nephritis. He gives 0.2 or 0.3 gm. calomel three times a day, continuing for three or four days, by which time the urine usually increases to 6 liters or more. The diarrhetic stools under the calomel also aid in throwing off excess fluids, but they must not be allowed to weaken the patient. The patient with acute weakness of the heart is frightened and restless, and this emotional strain aggravates the heart disturbance and calls for a sedative drug, although heart disease reduces the tolerance for narcotics. Grober emphasizes that the physician should keep the giving of the narcotics in his own hand; he does not like to trust this to the patient or his family. When the chronic heart disease is beyond repair and there are periodically recurring attacks of asthma, he does not hesitate to give morphin to abort the attacks.

In acute heart weakness, however, the chief reliance is on camphor, and he urges not to wait until it is a last resort. A subcutaneous injection of camphor seems to ward off the dangerous consequences of morphin on the circulation while not interfering with its action on the nervous system. The camphor may induce nephritis if the kidneys are already below par or if the patient is a child, but the serious condition of menacing heart failure outweighs in importance a possible injury to the kidneys. In acute heart weakness he does not hesitate to make several injections of 1 c.c. camphorated oil (10 per cent.) at five minute or even shorter intervals. When the heart action shows signs of improvement he lengthens the intervals to half an hour or an hour or changes to intravenous injection of some preparation of digitalis. The pressing danger once past, digitalis can be continued by the usual technic by the mouth.

72. **Serodiagnosis of Pregnancy.**—Oeller and Stephan state that the conception of autosensitization under the influence of pregnancy is all that is new in Abderhalden's work, and that his dialysis and optic methods of serodiagnosis have so many sources of error that there can be no question but

that they are based on mistaken premises. They obtained positive dialysis findings in a large number of men while the findings were occasionally negative in pregnant women. They report that by a preliminary dialysis for six hours with salt solution it seems to be possible to get rid of some antiferment bodies which otherwise inhibit or attenuate the digestion of the placenta tissue in the test.

Hirsch calls attention to the change in the concentration of the fluid after digestion of placenta tissue by the Abderhalden technic. If there is no change in the concentration of the fluid then it may be assumed that no digestion has taken place, and this is presumptive evidence of the absence of specific protective ferments. He uses an interferometer to test the fluid before and after for any change in concentration, and reports that tests with this technic have confirmed anew the strictly specific nature of the protective ferments.

74. **Sulphonal Poisoning.**—Pfortner's patient was a previously healthy woman of 30 with three healthy children. She developed manic-depressive insanity after an abortion without known cause. As she was growing rapidly weaker under her extreme restlessness day and night and irregular ingestion of food, she was given 10 gm. of sulphonal in the course of nine days. Obstinate constipation followed and the third day there was retention of urine for twenty-four hours and then the urine presented the typical port-wine tint of hematuria followed a day or so later by vomiting, colic and fatal collapse. Pfortner reviews other cases on record of hematuria after sulphonal, trional or veronal; Günther has compiled forty-seven sulphonal cases, with a mortality of 30 or over 53 per cent.; the outcome in 18 cases is not known but only 8 of the patients are known to have recovered. The disturbances ran an acute course in some and in others dragged over weeks and years. He advocates sodium bicarbonate in treatment. Necropsy has always revealed inflammation and atrophy of the kidneys, but nothing of the kind was found in Pfortner's fulminating case; probably there had not been time for them to develop.

75. **Periodical Arrhythmia.**—Rinderspacher reports the case of a girl of 10, always healthy until diphtheria the year before. Since then she had complained of pains in the back and chest and palpitation of the heart on slight cause. The tracings indicate mitral insufficiency but this does not explain the occasionally recurring irregularity of the pulse. This is evidently due to some periodical tendency to heart-block brought on by functional disturbance of the conducting fibers between the sinus and the auricle, on which becomes superposed at times the influence of stagnation in the coronary veins. This assumption is sustained by the fact that by putting an end to the coronary congestion, the heart-beat becomes regular once more. This case teaches that digitalis may prove useful even for heart-block.

76. **Pancreatitis Following Mumps.**—Dracinski and Mehlmann report that during a recent epidemic of mumps embracing hundreds of cases (Bukowina), three cases developed symptoms suggesting acute pancreatitis, but the syndrome subsided harmlessly in each in less than a week. Recovery was complete in about ten days after the first symptoms of mumps had been noticed. Each patient developed at about the fourth day of the mumps, herpes, intense frontal headache, vomiting suggesting ileus, fever with delirium, collapse, pains and tenderness above the umbilicus, intense acetoneuria and Cheyne-Stokes breathing, and in two the pulse grew very slow. In each of the three the knee-jerk was abolished, as was also the case in 10 per cent. of all the mumps patients examined, and in all the cases with this finding the course of the mumps was exceptionally severe.

77. **Retention of Urine under Morphin.**—Czapek and Wassermann report five typical cases in which complete retention of urine followed a therapeutic dose of morphin. Pal and Hirsch found that spasmodic contraction of the pylorus was frequently observed in dogs after a dose of morphin, and the same mechanism is probably involved in the occasional retention of urine after morphin has been given, the bladder sphincter closing up, and the auxiliary abdominal muscles

being too weak to force it. It has been observed only in men, and it is possible that the retention of urine from this cause may occur after operations on the skull and abdomen and be ascribed to operative shock and other causes.

80. **Sawing the Patella.**—Babitzki's patient has complete functional use of the injured leg and can climb stairs, etc.; a year has elapsed since the operation done to correct dislocation of the internal meniscus of eighteen years' standing. To obtain ample access to the meniscus without injuring the muscles and ligaments, he cut down lengthwise on the median line, sawing through the patella and turning back the halves. The technic has proved so satisfactory that he commends it to others and gives an illustration of the joint thus opened up.

Zeitschrift für Urologie, Berlin

July, VIII, No. 7, pp. 529-608

- 83 *Endoscopic Diagnosis and Treatment of Proliferating Urethritis. H. Lohstein.
84 *Kidney Operations with Bilateral Kidney Disease. (Nierenoperation bei doppelseitigen Nierenkrankungen.) L. Casper.
85 Second Urethra without Connection with Bladder. (Blind endende 12 cm. lange zweite Urethra.) M. Porosz.
86 Simplification of Endovesical Operations. J. Vogel.

83. **Proliferating Urethritis.**—Lohstein here confirms anew his statements of eight years ago in regard to the necessity for more vigorous measures than usual when urethritis assumes a proliferating type. Curetting may be necessary before the inflammation shows signs of yielding. He gives directions how to do the curetting without injury, saying that he has done it 600 times on 100 patients. In seventy-five of the cases the obstinate discharge became much reduced or disappeared entirely after the curetting done under endoscopic control. He gives an illustrated description of a little roller attachment for the urethroscope which he uses to squeeze out and massage foci of retention in the urethra when there is no actual proliferation of tissue. It may be usefully combined with the curet. The points in which the secretions are most liable to be retained are the prostatic fossula, the bulb and the middle of the pars cavernosa.

84. **Kidney Operations with Bilateral Kidney Disease.**—Casper relates that eight soon died in nine cases of bilateral kidney disease in which the results of functional tests misled him to assume that the second kidney would be equal to the task imposed on it by nephrectomy. He now refrains systematically from operating if—even once—no sugar is eliminated in the segregated urine after the phlorizin test, or if the test with a stain shows tardy change in the tint of the urine, and the tint is merely green, or if the kidney merely stiffens up from lack of the normal reaction to intake of fluids. These are his main criteria for judging the degree of insufficiency of the other kidney. He thinks that tests with alien substances give more reliable findings than those with substances found in the body.

When no sugar is eliminated after the phlorizin test in a case of contracted kidney, this shows that the individual is so impaired that he is scarcely able to stand the removal of the other kidney. If the test indigo-carmin is also eliminated unduly slowly, and there is not the normal polyuria after drinking a given amount of water, it is better to abandon a contemplated operation on the kidney primarily involved. He has made thousands of tests with phlorizin and found that healthy kidneys, without exception, eliminate sugar thereafter. Some mechanical obstruction or defective phlorizin must be incriminated when a negative response is obtained from a healthy kidney. The phlorizin settles to the bottom of the receptacle as the solution cools. Another possible source of error is extreme dilution of the urine from drinking much water. The test is less distinct when the patient is fasting; it is best to allow merely one to three hours after a meal. Considerable albuminuria is also liable to mask the findings of the test. In the few cases in which the negative findings failed to harmonize with the apparently normal condition of the kidneys, the further course of the cases gave the explanation as a hitherto latent contracted condition of the kidney became apparent. Atrophy from pressure can also run a latent course for a time. In a number of cases of

enlarged prostate the kidney parenchyma had wasted away to merely a small strip of cortex, and this can occur without appreciable symptoms. Sometimes polyuria may be the only manifestation of this loss of kidney substance under the influence of pressure.

Zentralblatt für Chirurgie, Leipsic

August 1, XLI, No. 31, pp. 1281-1312

- 87 Extension Dressings of Tubular Tricot and Varnish. (Trikotschlauch-Mastisol-Extensionsverbände.) E. A. Lüken.
88 Mobilization of Abdominal Wall to Draw It over to Close Large Defect. (Mobilisation der Bauchwand bei grossen Ventralhernien.) S. Wideröe.

Zentralblatt für Gynäkologie, Leipsic

August 1, XXXVIII, No. 31, pp. 1089-1120

- 89 *Mesothorium in Treatment of Cancer. P. Zweifel.
90 *Intra-Uterine Application of Radium for Cancer. (Zur Wertung der intrauterinen Radiumapplikation bei Carcinoma uteri.) E. Meyer.

89. **Mesothorium in Treatment of Cancer.**—Zweifel's microscopic findings in cancers after mesothorium treatment confirm the destructive action on cancer cells; the normal cells showed comparatively little change under the exposures. His experience warns of the necessity for extreme care in protecting the abdomen outside of the focus; some stray rays in a few cases evidently did some injury as the patients complained of severe pains and tenesmus and one passed some scraps of bowel tissue in the stools. He recalls two of his older cases of uterine cancer in which the cancer was apparently cured by an extensive local streptococcus process but returned three or four years later. He thinks that the action of mesothorium must be explained in much the same way; the reaction to the mesothorium rays is like a burn, and in the course of this physical process the cancer cells become destroyed and are reabsorbed. It is possible, further, that the reabsorbed cells have a therapeutic action like the autolysates. He urges all who apply radiotherapy to publish an additional report on their cases after a year has elapsed.

90. **Intra-Uterine Application of Radium for Cancer.**—In the first of the two cases under the influence of the endocervical radium treatment a cancer of the cervix subsided completely, leaving merely a considerable defect. In the second case the same technic led to fulminating sepsis, speedily fatal. Necropsy failed to reveal any cause for the difference in the results observed.

Zentralblatt für innere Medizin, Leipsic

August 1, XXXV, No. 31, pp. 745-768

- 91 *Clinical Importance of the Systolic and Diastolic Blood-Pressure in Infectious Diseases. (Blutdruck bei Infektionskrankheiten.) J. S. Schwarzwann.

91. **The Blood-Pressure in Infectious Diseases.**—Schwarzwann here summarizes his conclusions from study of the systolic and diastolic blood-pressure in eighty cases of various acute infectious diseases. A high diastolic blood-pressure indicates a tendency to paralysis of the larger abdominal vessels with accumulation of the blood in them, and hence this must be accepted as a sign of the severity of the infection. A lower systolic pressure with a lower diastolic pressure is not a sign that the heart is weakening but only that the vascular tonus is growing less. On the other hand, when the diastolic pressure rises while the systolic falls, this is a sign that the heart is weakening. The importance of these findings for the prognosis and for prompt therapeutic measures is obvious.

Policlinico, Rome

July, XXI, Surgical Section No. 7, pp. 309-360

- 92 *Tuberculosis of the Breast. (Tubercolosi della mammella muliebri.) L. Durante.
93 Subphrenic Abscess Following Measles in a Child under Five. P. Ligabue.
94 *Paraffin and Wax Shield in Treatment of Inguinal Hernia in Children. (Nuovo procedimento nella cura radicale dell'ernia inguinale nei bambini.) A. Nota.
95 Subglenoid Dislocation of the Humerus. A. Sebastiani.
96 *Degrees of Detachment of the Mesentery Compatible with Retention of the Vitality of the Intestine. (I vari gradi del distacco del mesentere in rapporto alla vitalità e funzionalità dell'intestino.) P. Azara. Commenced in No. 6.

92. **Tuberculous Process in the Breast.**—Durante adds two new cases to the 150 he has found on record. The tuberculosis seemed to be primary in the breast in one of his cases. Six of the patients were males. The ages ranged from 20 to 40 in the majority and an inherited taint was generally evident. Trauma was incriminated in three cases. When there are other tuberculous lesions the diagnosis is easy when the isolated hard nodules are discovered in the breast, especially when the nodules are adherent to the skin and the lymph-nodes in the axilla display a tendency to enlargement. He insists that amputation of the breast or excision of the focus should be done at once with an incipient or primary tuberculous process but when there are already multiple fistulas, or the mammary process is secondary to tuberculous lesions elsewhere, iodine, locally and internally, with general measures, is the main reliance.

In one of his own cases the microscope showed simple adenofibroma of the breast with typical tuberculous lesions in the lymph-glands surrounding the mamma and in the axilla. The patient was a frail woman of 33 who had never menstruated. The glands around the mamma and in the neck had commenced to enlarge seven years before and there was dulness over both apices. The mammary affection was evidently a retrograde process from the axillary glands, but instead of setting up a typical tuberculous lesion, merely an ordinary fibrous growth was produced. The second patient was a healthy girl of 19 who suddenly developed pruritus in the lower part of the mamma and in a few days a lump appeared, tender on pressure; in five days it developed a fistula. The Wassermann was negative, the skin tuberculin reaction slightly positive. Excision of a scrap the thirtieth day after the first symptoms revealed giant cells but no acid-fast bacilli. The lesion was excised into sound tissue. It was, evidently a primary process. The girl had never been pregnant.

94. **Inguinal Hernia in Children.**—Nota gives an illustration showing his method of blocking the inguinal canal with a sheet of paraffin cut to form a deep crescent which is introduced under the cord, the horns extending upward under the pillars on each side. The canal is then sutured together over the paraffin plate in three tiers. Experiments on animals had demonstrated the smooth healing and permanent integrity of plates made of equal parts of wax and of paraffin with a melting point at 50 C. They are boiled together for twenty minutes and then poured on a sheet of glass to form a plate 3 mm. thick. The wax is absorbed in time, its place being taken by connective tissue which thus forms a solid shield with the paraffin. He has found this method extremely simple and reliable as he has applied it in 150 cases, and it proved equally effectual for two youths of 14 and 18. Some of the children were under 2.

96. **Separation of the Omentum Compatible with Retention of Vitality of Intestine.**—Azara concludes from his experiments on fourteen dogs that separation over a stretch of 5 cm. along the margin of the bowel does not compromise it beyond repair, and hence that up to this distance treatment can be conservative. With separation over a stretch of 6 cm., the functioning of the intestine is so seriously compromised that resection is required unless there is a strip at least 1 cm. wide left still attached to the intestine. This is sufficient to maintain its vitality as a rule. But a stretch 18 to 25 cm. long, even at a distance of 3 cm. from the edge of the intestine, entails inevitable gangrene of the bowel. A stretch up to 15 cm. long, with a strip left on the bowel 3 cm. wide, never was followed by gangrene but cicatricial shriveling sometimes interfered with bowel functioning. Conservative treatment is indicated in this case but the patient should be supervised, ready to operate on suspicion of trouble.

Tumori, Rome

May-June, III, No. 6, pp. 697-827

- 97 *Comparative Study of Different Biologic Techniques for Diagnosis of Cancer. (Nuove ricerche comparative sui metodi d'indagine biologica per la diagnosi dei tumori maligni.) G. Mioni.

- 98 Autolysates of Embryonal or Cancer Tissues in Treatment of Cancer. (Immunizzazione attiva o chemoterapia istologica.) G. Fichera.
99 Chronic Inflammation and Benign Tumors of the Breast. (Flogosi croniche e tumori benigni della mammella.) A. Cimoroni. To be continued.

97. **Biologic Tests for Cancer.**—Mioni has been making a comparative study of various biologic tests and states that the meiostagmin reaction proved positive in 57.1 per cent. of the thirty-five cases; Crile's hemolytic test was positive in 62 per cent. and in the negative cases the cancer was in an advanced stage or a superficial growth so that the diagnosis was clinically beyond question. On the other hand, in most of the cases giving a positive response the cancers were in the viscera and many of them in the earliest stages of development. The fact that hemolysis occurs also in tuberculosis, etc., scarcely invalidates this test as the clinical manifestations otherwise exclude mistakes as a rule. Elsberg's reaction was obtained only in 11.2 per cent. The antitryptic index was characteristically high in 91.4 per cent. and thus proved its value as an aid in the diagnosis of cancer in dubious cases. The deviation of complement tests did not give reliable results in his hands, and passive anaphylaxis tests also proved uncertain. He remarks in conclusion that after excision of the cancer the various biologic tests all veered more or less promptly to a negative reaction. The details of the various groups tested with the different techniques are tabulated for comparison—a total of thirty-five cancer cases and thirty-five controls, all put through the various tests.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

April 11, LVIII, No. 15 and Supplement, pp. 1117-1278

- 100 *Hemipic Reaction of the Pupil as Aid in Diagnosis of Brain Tumor. F. S. van B. Bastiaanse.
101 Unfavorable Workings of Workmen's Compensation Laws. J. A. Korteweg and B. H. Sajet.
102 Plague in Java and Measures to Combat It. G. Brouwer and J. I. van Loghem.
April 18, No. 16, pp. 1279-1346
103 Classification of Club-Foot on Anatomic Basis and Treatment Adapted to Each Form. F. Schultze.
104 The Movements of the Stomach as Studied under Roentgenoscopy. P. C. Romkes.
105 *Fatal Action of Hypnotic in Case of Jaundice. A. Hendriks.

100. **Hemipic Reaction of Pupil as Aid in Diagnosis.**—Bastiaanse expatiates on the importance of determining a hemipic reaction of the pupil. With the extremely simple procedure he describes it is possible to distinguish between central hemipia and hemipia resulting from an interruption in the optic tract. The test can be applied even to a sleeping child, and the findings are more objective than determination of changes in the visual field. An illustrated description is given of a typical case. The patient was a stout woman of 47, who complained seven years ago that her eyesight was growing poor. The hemipic reaction indicated interruption of the optic tract and the further course of the case confirmed the assumption of a tumor pressing on the sella turcica, etc.

105. **Death after Ordinary Dose of Medinal in a Case of Jaundice.**—Hendriks' patient was a well built man of 41 with cirrhosis of the liver, ascites and jaundice. Although confined to bed he was in such good condition that omentopexy was being considered. As he worried over the prospect of the operation and had not slept well for a few nights, Hendriks prescribed a sedative, a mixture of 200 mg. anti-pyrin; 700 mg. medinal; 2 gm. potassium bromid, and distilled water to 30 gm. The patient took, as ordered, one tablespoonful in the evening and slept but did not wake. He was found in coma in the morning, and died the following night with symptoms of pulmonary edema. Hendriks says that no other cause for the fatality could be discovered except the action of the hypnotic in a patient with intense jaundice.

Hospitalstidende, Copenhagen

August 5, LVII, No. 31, pp. 953-984

- 106 Experiences with Serodiagnosis. (Kritik over Alderhaldens Dialysemetode.) A. Bisgaard and A. Korsbierg.
107 Chondroma in the Larynx. (Klinisk Bidrag til Strubens Bruskvulster.) K. Salomonsen.

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THE HEART IN THE PNEUMONIAS*

ROBERT N. WILLSON, M.D.

PHILADELPHIA

According to the vitality and endurance of the heart and the circulatory system (including its vasomotor supply), may be reckoned the outcome of the given instance of pneumonia. Seldom, if ever, will the mechanical obstruction of the lungs prove a serious factor except in its influence on an already crippled cardiac mechanism. The less perfect the aeration of the blood in its passage through the pulmonary tissue, the more positive is the deprivation of the cardiac structure (muscle, ganglion and nerve) of its proper supply of nutriment.

The importance of this influence is emphasized by the reflection that the blood, under conditions of health, demands over 90 per cent. saturation with natural oxygen as the result of its passage through the lungs.¹ The more complete the stoppage of the blood- and lymph-streams in their course through the walls of the air-vesicles, the more real is the mechanical overload thrown on the pulmonic valve, and soon on a toxemic, tired, right ventricular wall. The more intense and virulent the toxemia, the more certain and extensive will be the damage to the entire cardiac mechanism, vascular, nervous and muscular. Yet there is often to be noted at the necropsy table a surprising discrepancy between the severity of the pneumonic process and of the toxemia, and the apparent damage sustained by the heart.

Many observers have commented on the fact that the heart in certain virulent, fatal pneumonias may appear to be affected in surprisingly mild degree. There may be little or no dilatation, no apparent incompetence of the valves, in short, seemingly no abnormality of a heart in a patient who has from the onset of the toxemia appeared to be doomed in spite of every effort to combat the disease. Such instances are practically always examples of intense, fulminant poisoning, in the so-called croupous or fibrinous type of the disease. The course is brief, the attack is largely on the nervous centers, and the heart, though always participating in the storm, seems to maintain a remarkable degree of power and equilibrium to the very end.

Not infrequently the microscope will reveal appreciable damage that escapes the naked eye. Clinically, as well as at the necropsy, however, the heart-muscle appears to be the last vital force to give way. Not so, in the many instances of bronchocatarrhal pneumonia,

in which we practically never observe a sthenic patient or a heart which gives either clinical or post-mortem evidence of strength, stability or endurance.

One learns to associate the bronchocatarrhal type of pneumonia with a weak, dilated right heart, and on this basis very early to discriminate it from the croupous or fibrinous form of the disease. The temperature is irregular and low, the pulse running, rapid and often irregular, the patient asthenic far beyond the degree commensurate with the amount of pulmonary involvement—such is the clinical picture of the form of the disease in which the cardiac musculature and the vasomotor nervous system seem to sustain to such a preponderant degree the brunt of the attack. After such a pneumonia the post-mortem examination reveals almost invariably a flabby, characterless heart-muscle, of which incompetence is the main feature and dilatation the most meaningful expression. Routier² has recently reported a pneumonia in which the influence of the toxin on the fibers of the auriculoventricular conducting path resulted in a transient heart-block which disappeared spontaneously. By no means infrequently, however, the walls of both the left and right ventricles are thinned, and all of the valves, pre-eminently the pulmonic and tricuspid, are insufficient. I have one interesting specimen in my collection (Fig. 2) in which the conus arteriosus and the pulmonary artery both show marked permanent stretching and distention, the pulmonic valve appearing wide open between.

THE MICROSCOPIC CHANGES

I think it permissible to say that the heart shows post-mortem evidences of the toxemia in every fatal case of fibrinous, as well as of bronchocatarrhal pneumonia, that reaches the microscope. In the latter type of the disease the changes are more likely also to be macroscopic. I think it likely that every heart that weathers the pneumonic storm sustains similar lesions, of milder degree perhaps, yet from which it probably never fully recovers.

During the past year I have taken great interest in studying microscopic sections of the cardiac musculature from fatal cases of pneumonia in the wards of the Philadelphia General Hospital. In not a single instance was there a lack of evidence that a toxic influence had been actively at work. Usually the process appeared in the form of an acute diffuse myocarditis, with cloudy swelling of the cells, often with fragmentation of the muscle-fibers. In the great majority of cases the striations had nearly disappeared from the fibers, over wide areas, if not generally throughout the heart. Not infrequently could be found here and there areas showing extensive round-cell infiltration,

* Read before the Section on Practice of Medicine at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Cooke and Varcroft: *Jour. Physiol.*, 1914, xlvii, 35.

2. Routier: *Arch. d. mal. du coeur*, May, 1914.

mainly of the interstitial substance between the fibers. In quite a number of instances, as exemplified in Figure 3, there was wide-spread hemorrhagic infiltration. The nuclei of the muscle-cells were proliferated, were often swollen, and here and there vacuoles appeared in their place. Many of the muscle-fibers gave the appearance of being atrophied. In no case except in old persons, or in those afflicted with organic cardiac

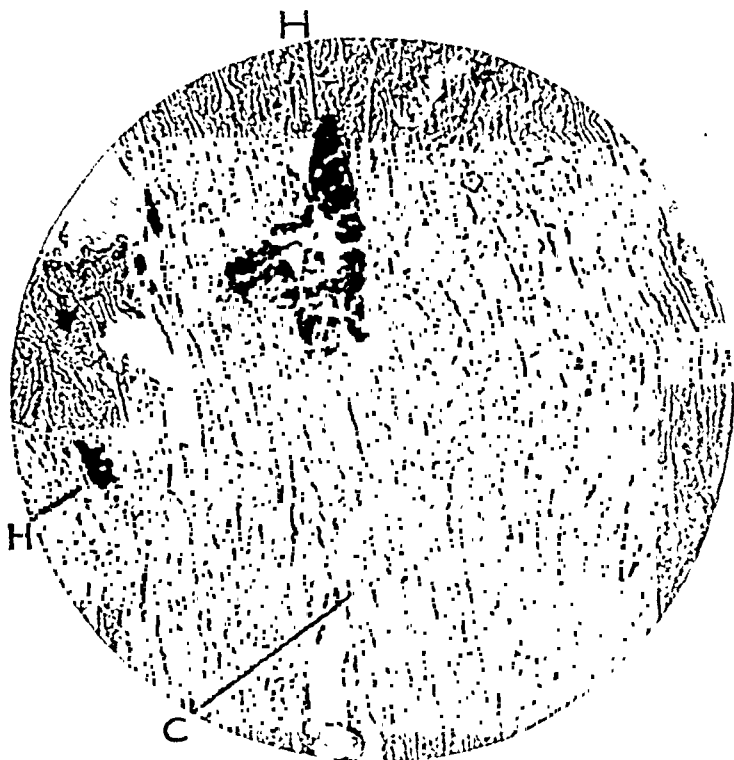


Fig. 1.—The heart-muscle in a case of croupous pneumonia, showing the rich capillary blood-supply to each fiber, the capillaries lying within (or in a groove in) the latter (C); inter-fibrillar hemorrhage (H), and complete loss of striae.

disease, was fatty degeneration of the heart-muscle observed.

Macroscopically as well as microscopically, there was evidence in every heart examined of some degree of pericarditis. I observed not one instance in over a year's time of fresh endocarditis, except such as was superimposed on an old lesion.

THE BLOOD-PRESSURE

Before using the blood-pressure as an evidence of either cardiac competence or insufficiency in the pneumonias, it is incumbent on us to show that in a sthenic pneumonia the customary or normal pressure is due to an overacting or at least a capable heart; while in the low-grade or asthenic pneumonias the low pressures are due to an incompetent cardiac mechanism rather than to vasomotor failure. The personal equation will of necessity enter largely into the verdict rendered by various investigators of this question. During the past three years I have studied more or less thoroughly over seven hundred cases of pneumonia on the wards of the Philadelphia General Hospital. Both with the finger on the radial, carotid and apical pulses, and with the sphygmomanometer, I have measured the blood-pressure in very many of these cases. I have a few records of the systolic pressure made in certain sthenic fibrinous pneumonia cases reading as high as 170 and 180 mm. of mercury. Far more often the readings followed approximately the normal line (from 120 to 140 mm.). I refer, of course, only to the active and sthenic stages of the toxemia. I have yet to see in a patient with pneumonia

of the bronchocatharrhal type (except in childhood) an instance of high or even of normal systolic blood-pressure. Even in instances associated with symptoms of nephritis, or with arteriosclerosis of high grade, there has persisted a low systolic pressure, indicating insufficiency of cardiac vigor and driving power.

The diastolic pressure, elicited by the auscultatory method, furnishes a fair index of the vasomotor tone. While this also is usually lowered in pneumonias of the asthenic type, it falls by no means in a measure commensurate or parallel with the cardiac power. Thus the systolic pressure in cases of bronchocatharrhal pneumonia during the stage of active toxemia has averaged not far above 100 mm., while the diastolic pressure has seldom registered below 80 mm., yielding an average pulse-pressure of 20.

This fact, together with such manifest indications of cardiac insufficiency as systolic jugular pulsation, arrhythmia, small rapid pulse, enlargement of the area of cardiac dullness to the right, and often a series of valvular murmurs that can only be interpreted as indicative of muscular (relative) insufficiencies, apparently allow us but one possible conclusion, namely, that in the great number of low-grade pneumonias the heart-muscle must be ever an object of care and concern. Gibson³ has called attention to a possible prognostic relation of the systolic cardiac pressure to the pulse-rate. Lauder Brunton has made a similar study of the diastolic pressure. In my own experience the systolic pressure has furnished a very uncertain prognostic index, for the reasons already stated. The majority of the low-grade pneumonias have presented a systolic pressure almost constantly lower than the pulse-rate, and yet the vast majority of these patients, when properly treated, have recovered.

THE INFLUENCE OF TREATMENT

Considerable evidence may be gained as to the actual condition of the cardiac mechanism through studying the results of treatment. It is a current belief and

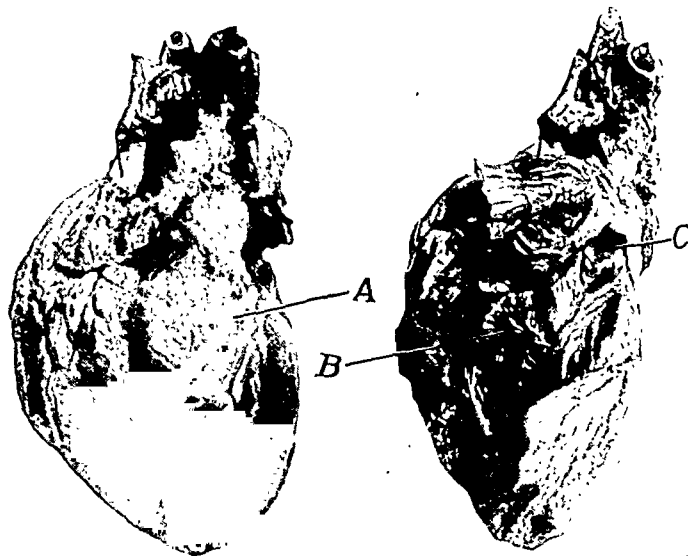


Fig. 2.—Pneumonia heart, showing (A) dilated conus arteriosus and right ventricle from without, and insufficient tricuspid (B) and pulmonic (C) valves.

teaching, employed perhaps more freely than is justified by circumstances, that the pneumonic patient dies not of his pulmonary involvement, and not of his cardiac embarrassment, but owing to paralysis of the vasomotor system. In acute fibrinous sthenic pneumonia there would seem in certain instances to be at

3. Gibson: *Edinburgh Med. Jour.*, 1908, lxx, 22.

least some reason to support this view. In the bronchocatarrhal type of the disease there is exceedingly little. No better illustration could be given of the truth of this assertion than the fact that the high or normal blood-pressure in the fibrinous type appears to be due to overaction of a sthenic heart; while conversely, in the bronchocatarrhal form the asthenia and the almost invariably low blood-pressure appear to be

otherwise healthy, non-alcoholic men and women should recover. Not so with the bronchocatarrhal, asthenic pneumonia patient, who must be supported actively through the disease because his vital forces, especially his cardiac mechanism, are all below par. Many a case of mistreated pneumonia takes on a totally different appearance when placed under conditions that favor and nourish instead of depleting the tone and strength of the heart. Perhaps the best illustration may be had in the misuse of cold air on an asthenic patient suffering from pneumonic toxemia. I have placed many such shivering, cyanotic subjects in warm, clean air and witnessed the immediate reestablishment of forces that were fast beginning to wane. Uppermost and most striking of all appeared to be the influence on the heart, which craved oxygen as its natural stimulant and tonic, but needed it in the form of warm, as opposed to cold, clean air.

PREEXISTING CARDIAC DISEASE

A final bit of evidence as to the importance of a thoroughly healthy cardiac mechanism—including musculature, valves, endocardium, ganglia and nerves—is observed in the high mortality of cases that enter on a pneumonic toxemia with preexisting cardiac disease. We have all seen instance after instance of a patient making a bold fight to weather the storm, and experiencing sudden cardiac collapse, either in mid-stream or on the brink of convalescence. Only recently I witnessed an acute pneumonia in a young man of 22 years, an alcoholic, with myocardial degeneration and high-grade mitral stenosis and insufficiency, all sclerotic and probably syphilitic in origin. He went to bed in the beginning of an intense pneumococcus infec-

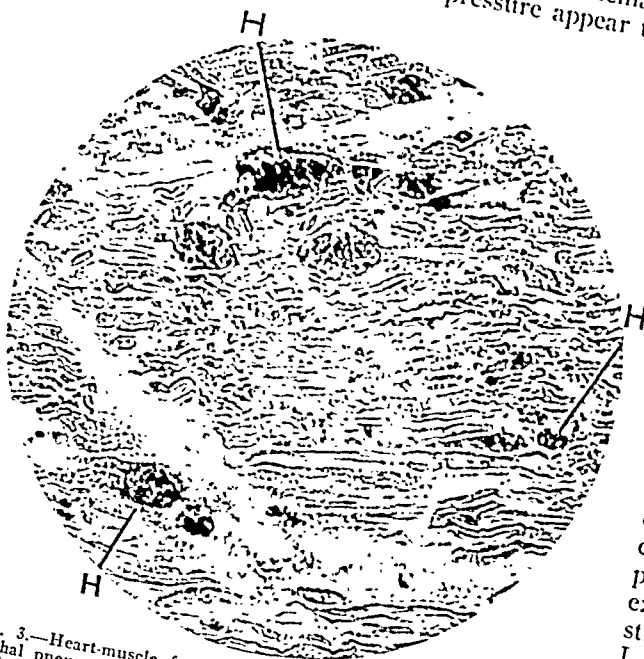


Fig. 3.—Heart-muscle from the left ventricle in a case of bronchocatarrhal pneumonia. Extensive degeneration of the fibers, with wide spread hemorrhages (H). Striae completely lost.

due not nearly so much to loss of vasomotor tone as to actual cardiac dilatation and disability. Instances that admit of reestablishment of the cardiac tone do well. The most telling advantage seems to come from the systematic and thorough emptying of the intestinal tract, in many cases the manufactory of the toxic products. When the bowel has been deliberately rendered and kept clean the heart has, in my experience, seemed to have its best opportunity for rehabilitation. The moment the bowel has been neglected the heart has apparently suffered in a measure that is not to be explained on the basis of mere mechanical embarrassment. Such remedies as nux vomica, quinin, camphor, digitalis and oxygen in Nature's own form of warm, clean air, may serve as cardiac tonics and, on occasion, as indispensable temporary crutches. Under their influence the blood-pressure rises and may be maintained at a more favorable level.

On the other hand, such drugs as epinephrin and pituitary extract I consider dangerous in the presence of a weak heart. While they are certain to afford a momentary rise in the blood-pressure as the result of their influence on the vasomotor system, I have more than once seen evidence of their mischievous, and possibly lethal, action on a weak heart, through the imposition on its crippled musculature of an additional load in the form of a tense peripheral circulation. Nature knows better than we when to elevate and when to lower the intravascular tension.

In a sthenic fibrinous pneumonia practically any treatment may be employed. We start and finish with the knowledge that in the vast majority of instances,

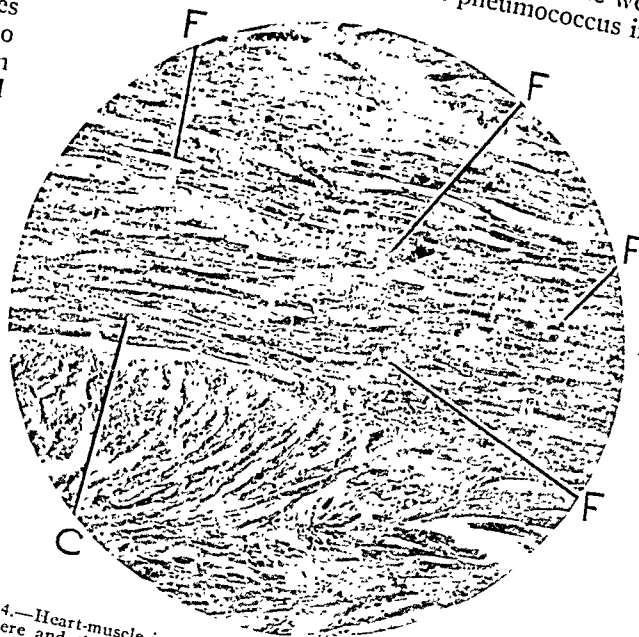


Fig. 4.—Heart-muscle in a case of bronchocatarrhal pneumonia. Striae show here and there, but have mostly disappeared. Considerable fragmentation of the fibers (F). The capillary blood-supply is beautifully distinct (C).

tion with a heart widely dilated, an irregular pulse and edematous extremities. Within two days he showed a steady, remarkable cardiac gain. The jugular pulses became almost undiscernible, the apical pulse regained its regularity, the edema entirely disappeared from the extremities. With these signs of cardiac rehabilita-

tion, the whole aspect of the pneumonia (croupous or fibrinous, as shown at the necropsy) altered. The patient was no longer cyanotic, the breathing became more free, and it appeared almost as though even this desperate case might win out against the acute disease. Suddenly and coincidentally with an apparent crisis, all the signs of cardiac distress reappeared, and in a brief period evident cardiac, not pulmonary, death supervened. The heart had reached its recuperative limit, and could draw no further on a reserve force, because it had no further stock in store. In the same manner a tobacco- or alcohol-weakened cardiac muscle may decide the issue between life and death in an otherwise favorable pneumonia.

CONCLUSION

Without attempting to minimize the influence of the vasomotor system in the causation of a high mortality in pneumonia, it would seem as though we ought not to be satisfied, on the basis of either clinical or laboratory experience, to regard the heart in any other

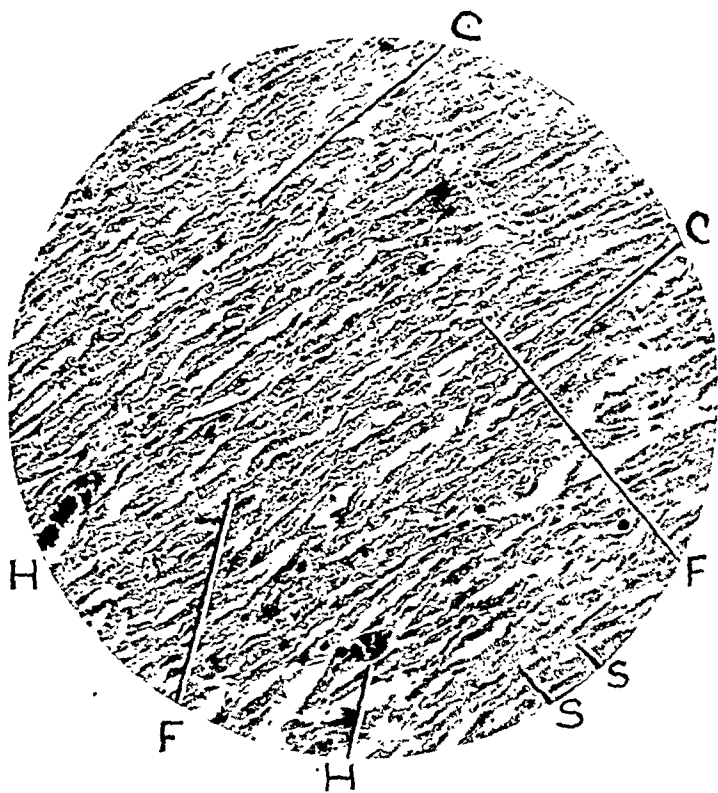


Fig. 5.—Heart-muscle in a case of bronchocatharrhal pneumonia, showing considerable atrophy of the fibers, scattered hemorrhages (*H*) and extensive fragmentation (*F*). Striae are seen here and there (*S*). Capillary blood-sunily is exquisite (*C*).

way than as the factor of prime importance in the safety or danger of the great majority of asthenic pneumonia patients. More and more does the prevalent pneumonia seem to be tending away from the well-recognized, frank sthenic type, to the low-grade, asthenic, bronchocatharrhal forms. The more certainly this is true, the more inevitable will be the necessity of safeguarding the heart from start to finish, not so much by the use of drugs as by their avoidance (especially cardiodepressants like nitroglycerin and alcohol), not so largely by treatment as by the studious prevention of an overdose of solicitous care. Hygiene of the intestinal tract, sane feeding, the intelligent use of an abundance of clean air of the right temperature, and the insuring of ample periodic freedom from the doctor, nurse and family will go farther than any others toward supporting the organ whose staunch cooperation is essential to the happy outcome of the case.

1827 Spruce Street.

ABSTRACT OF DISCUSSION

DR. JAMES M. ANDERS, Philadelphia: I feel convinced that Dr. Willson is right in stating that pneumonia has been assuming an irregular bronchopneumonic type in recent years to a greater degree than formerly. This fact may be attributable to the more constant and general prevalence of various forms of influenza. The view that death in uncomplicated cases of pneumonia is due to the specific effect of the toxemia on the heart is widely accepted. Perhaps it would be more nearly correct, in the present state of our knowledge, to say that death is caused by the general rather than the local effect of the toxemia. As pointed out by Dr. Willson, the whole vasomotor system is profoundly involved in many cases. The heart is frequently dilated, especially the right side, and filled with firm coagula. It has long been held that if the more usual cardiac complications, such as acute endocarditis, pericarditis and fatty degeneration in protracted cases, be excluded, the changes presented by the myocardium are conspicuous by their absence. The results of the microscopic studies by Dr. Willson, therefore, are not a little surprising, but will constitute a distinct advance in our knowledge of pathologic changes found in the heart in pneumococcal infections, especially if confirmed by the findings of other competent observers. The frequency and seriousness of the disease in question make it desirable that further histologic investigations of the subject be undertaken. I quite agree that cold or fresh air in the treatment of pneumonia is one of the best, if not the best measure at our command, but it should not be indiscriminately employed. It has not a specific influence, but does increase resistance to the toxemia. Again, it should not be employed in cases in which active kidney lesions preexist.

DR. WILLIAM S. THAYER, Baltimore: Does Dr. Willson believe that the type of pneumonia has really changed from a sthenic to an irregular asthenic type? On what does he base his opinion? In over twenty-five years' observation of pneumonia in various regions I have not been able to detect any essential differences in the clinical character of the disease beyond, of course, the common variations in different epidemics. I am quite familiar with this assertion with regard not only to pneumonia but to other acute febrile diseases, especially typhoid fever. I rather think that the old-fashioned "typical case" is essentially a picture in the mind of the observer based on text-book descriptions—an impression so strong that in the course of years it becomes interpreted as actual experience; and that the common impression that such a disease as pneumonia is changing its type is largely based on the circumstance that in practice pneumonia shows frequent variations from this picture. I am not aware that such change in the clinical manifestations of the disease has occurred.

DR. ROBERT N. WILLSON, Philadelphia: In answer to Dr. Thayer's question, I have two grounds for the assertion that the prevalent type of pneumonia is gradually changing from that of the old-fashioned book type of fibrinous or croupous pneumonia to the low-grade or bronchocatharrhal form. First, my own personal experience in a series of several hundred cases, both in hospital and private work, leads directly to such a conclusion. This experience covers and includes considerable necropsy and microscopic work in confirmation of the diagnoses. My second basis of argument is the result of not a few conferences held with men in various localities over the country, who agree with me in my conviction as the result of their experience and study. Dr. Anders' statement, made a few moments ago, in discussing my paper, furnishes a case directly in point. I had not previously heard his position in the matter. I shall welcome similar studies of the heart in the pneumonias as confirmatory of my own. In every instance of pneumonia widespread damage to the cardiac musculature will be found. When this fact is recognized I think we will begin again to regard the heart as the organ and force mainly to be safeguarded and conserved, and to lay a little less stress on the vasomotor factors in grave cases of pneumonia.

THE USE OF SMALL DEEP SKIN GRAFTS

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The object of this paper is to call attention again to the value of very small grafts, especially to those which contain more of the true skin than the superficial grafts advocated by Reverdin. I have called these grafts "small deep grafts."

The hastening of the healing of granulating wounds by the use of small detached bits of skin was first demonstrated by J.-L. Reverdin.¹ His report to the Société Impériale de Chirurgie, Dec. 8, 1869, caused universal interest.

He showed a patient on whom he had practiced "epidermic grafting," and described the grafts as consisting of the epidermis only. He says, "I raised with the point of a lancet two little flaps of epidermis from the right arm, taking care not to cut the dermis."

Grafts obtained by Reverdin's method are usually

in character than when the thinner grafts are used (Fig. 1).

It is interesting, when we consider that Reverdin developed his method of grafting before the introduction of antiseptics and asepsis in surgery, and that his is probably the only type of graft which could have given satisfactory results under such conditions.

The favorable results obtained by other surgeons in England, America, Germany and France, following the use of Reverdin's method, undoubtedly stimulated further investigation along this line.

The tiny grafts of Reverdin were gradually superseded by much larger grafts of the same thickness, advocated by Ollier³ in 1872, and later by Thiersch⁴ in 1886. After a few years the value of the Reverdin method seemed to have escaped the attention of most surgeons, and one might be about a surgical clinic for years and never see this type of graft employed.⁵

USE OF SKIN GRAFTS

As there is little difference, except in thickness, between the "small deep grafts" and Reverdin grafts,

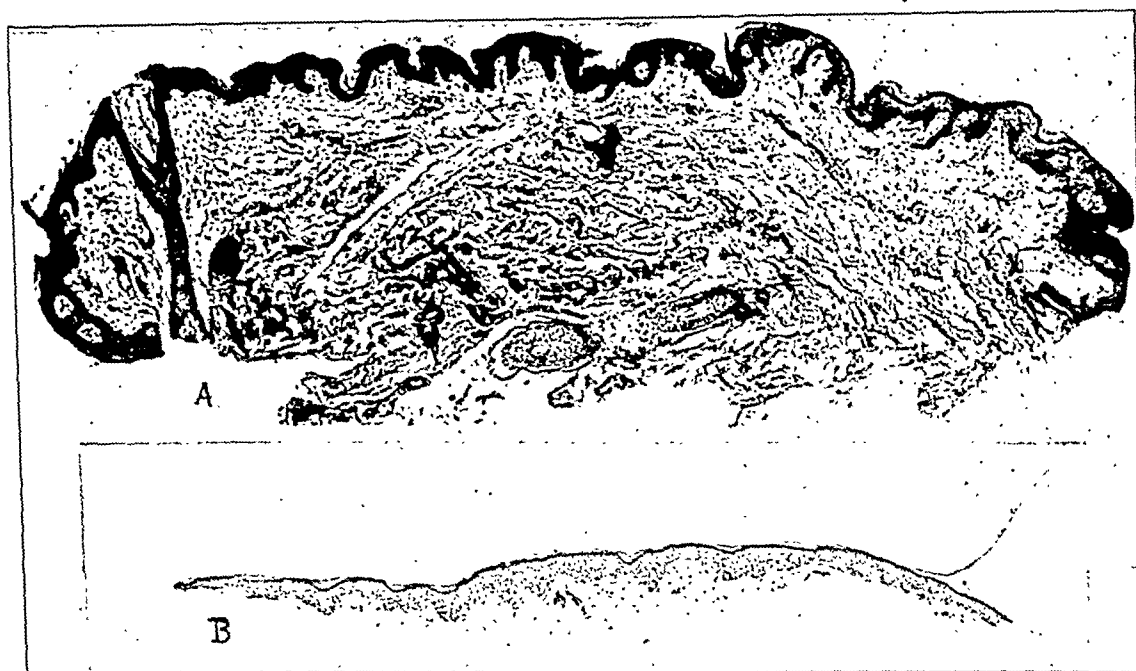


Fig. 1.—Photomicrographs of the same magnification showing the comparative thickness of a small deep graft and a Reverdin graft; A, a small deep graft cut to include a considerable thickness of the true skin; in the section the edges of the graft are curled inward; B, a Reverdin graft cut to include as little of the dermis as possible; there is a thin layer of the dermis throughout, which is thickest in the center.

thought of as pure epidermic grafts, and in his articles Reverdin always spoke of them as *greffe épidermique*; but in his exhaustive paper on the subject,² published in 1872, he says in part, "The title 'epidermic grafts' is not perfectly correct, as the transplanted bit is composed of the whole epidermis and a very little of the dermis."

Reverdin also said that if the epidermis alone could be transplanted, the same result would be obtained as when a part of the dermis was included. This, of course, is true as far as the epithelium is concerned, but it has been my experience in a large number of cases that the grafts which are somewhat deeper and contain more of the true skin give a more stable healing, and the final result is more like the normal skin

the following methods of preparation, etc., will be found applicable for either type.

Surface on Which Grafts May Be Placed.—The grafts may be placed on fresh wounds, but are usually applied to granulating surfaces. The success of small grafts depends to a large extent on the condition of the granulating wound, and it is most important that the granulations be clean, firm, rose pink in color, and not exuberant. Time is saved in the end by careful attention to this point. It is of advantage to place

3. Ollier: Bull. de L'Acad. de méd., 1872, i, 243.

4. Thiersch: Verhandl. d. deutsch. Ges. f. Chir., Berlin, 1886, xvii.

5. In a study of the first 550 cases grafted in Dr. Halsted's clinic at the Johns Hopkins Hospital, between 1889 and 1909, I found that Reverdin grafts were used in only two cases, and then in conjunction with Thiersch grafts. Since that time, however, the small grafts have been frequently used (Davis: Johns Hopkins Hosp. Rep., xvi). In 1909, Ehrenfried and Cotton, in an excellent and timely paper, again brought to the attention of American surgeons the value of Reverdin's method. In this paper there is also a complete historical review of the subject (Ehrenfried and Cotton: Boston Med. and Surg. Jour., Dec. 23, 1909, p. 911).

1. Reverdin, J.-L.: Greffe épidermique, Bull. de la Soc. impériale de chir. de Paris, Dec. 8 and 15, 1869, pp. 493, 511.

2. Reverdin, J.-L.: De la greffe épidermique, Arch. gén. de méd., 1872, pp. 276, 555, 703.

these grafts on a granulating surface, as there is no pain in the preparation of the surface; no danger of stirring up infection, and no loss of blood, which is an important point in cases already much depleted.

I will not consider at this time the various methods of bringing a granulating surface into healthy condition.

Method of Preparing Healthy Granulations to Receive Grafts.—On the day preceding the operation, all secretions and crusts are removed. The granulations are painted with tincture of iodine and dressed

ready to apply the grafts. It is most important that the surface to be grafted should be perfectly dry, as the grafts adhere much better to a dry surface, and are less liable to be subsequently displaced.

The Source of Grafts and Area from Which They Are Obtained.—Autografts are almost uniformly successful when placed on a granulating surface which is in proper condition.

Isografts are also successful in many instances, but there are wounds which have come under my observation on which no isograft would take, even after

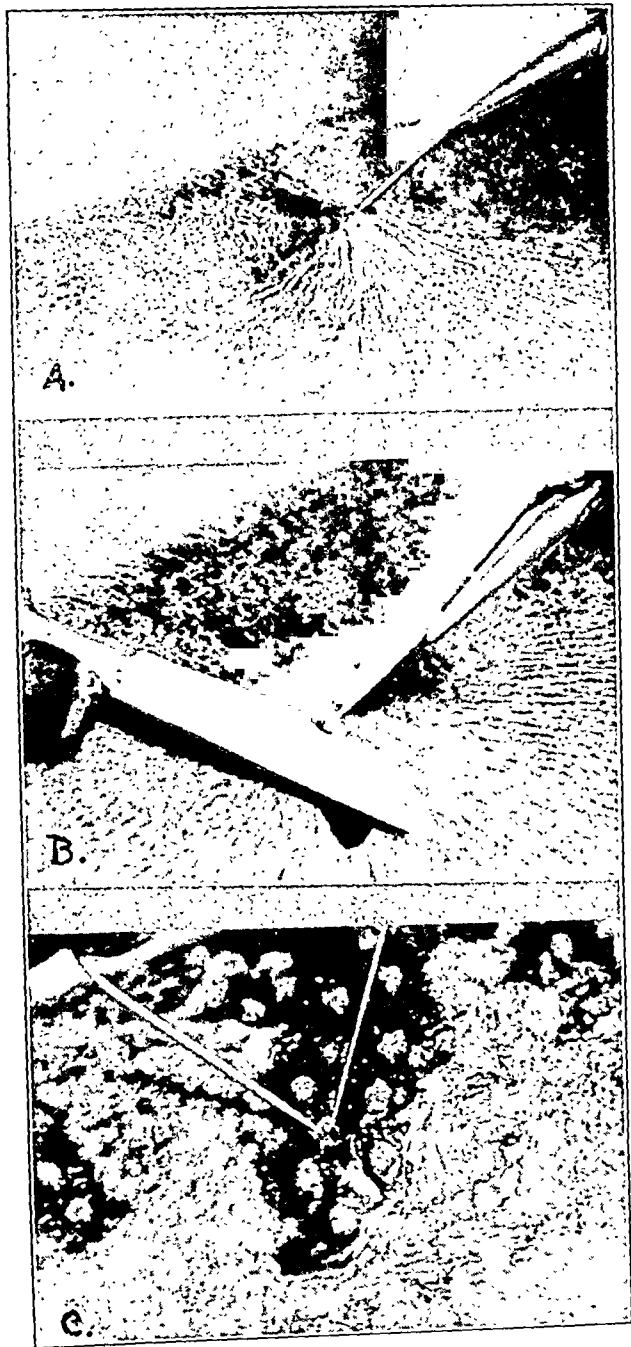


Fig. 2.—A, the straight intestinal needle, held in an artery clamp, with its point engaged in the skin. The skin is raised up in a little cone. B, the scalpel cutting through the base of the cone. C, placing the graft on a granulating surface. A large opened-out safety-pin is very useful in detaching the grafts from the needle. In this photograph none of the grafts have as yet been pressed down on the wound, and the edges are still curled under.

either with balsam of Peru and castor oil, 1:3, or with moist boric or salt gauze. The dressings are removed at the time of operation, and the wound washed carefully, without causing bleeding, with sponges dipped in warm salt solution. The surface is dried thoroughly and a pad of dry gauze placed over the wound; it is pressed down firmly on the granulations, and removed only when the operator is

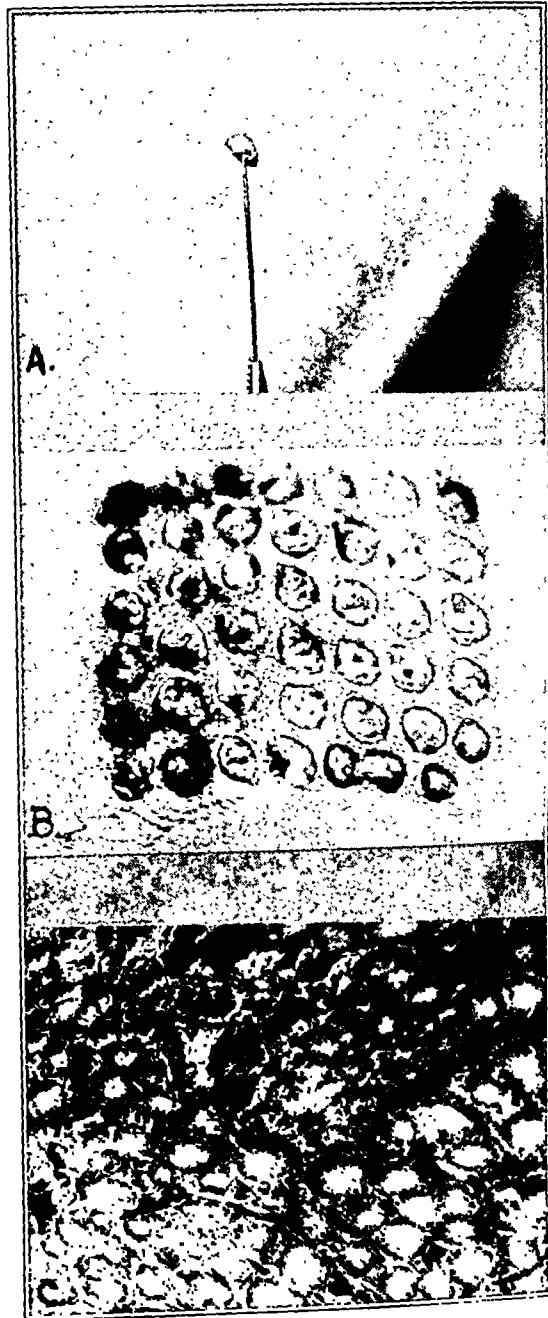


Fig. 3.—A, the actual size of a small deep graft with its edges curled under. When this graft is pressed down on a wound the edges flatten under, thus making the graft about one-third larger. B, the punched out defects left by cutting the grafts. Some are filling up with blood in spite of the epinephrin in the local anesthetic. Note the depth of the pits and the rim of undisturbed skin between them. C, a close view of an area grafted with small deep grafts. The grafts themselves are of normal-appearing skin, which is soft and flexible. Between the grafts is scar tissue, which is slightly depressed. The scaly appearance of this area is due to desquamation of epithelium. Photograph was taken six months after grafting.

repeated trials from many donors. Autografts on the same wounds healed promptly.

The grafts may be obtained from almost any portion of the skin. It is considerably easier to cut them from a region such as the front of the thigh (where

the skin is quite taut), than where it is lax, as for instance on the abdomen.

The region from which the skin is taken has little, if any, effect on the success or failure of the grafts.

A large number of these grafts can be obtained from a comparatively small area, thus making it possible to use small grafts on extensive wounds without any severe tax on an ill patient.⁶

Preparation of Area from Which the Grafts are Taken.—A satisfactory method of cleaning the skin before removing the grafts is to shave, and then wash thoroughly with green soap and water. Rinse with sterile water and sponge with ether, followed by alcohol; finally rinse with normal salt solution and dry. It is better to use no antiseptic in the preparation of this area, although very satisfactory results follow the use of iodine technic.

Anesthesia.—As these grafts are obtained with little pain and are usually applied to undisturbed granulations, general anesthesia is unnecessary, unless the patient is a young child, or in a highly nervous condition. It is as a rule desirable to inject 1 per cent. quinine and urea hydrochlorid solution, or 0.5 per cent. novocain, with a small amount of epinephrin, and take the grafts from the anesthetized area. The infiltration seems to have no hindering effect on the healing of the grafts.

TECHNIC

The simplest way to obtain these grafts is to pick up a bit of the epidermis with a straight intestinal needle held in an artery clamp⁷ (Fig. 2). It is raised so that a little cone is formed and the base of the cone is cut through by depressing the blade of the knife.⁸ (The thinner Reverdin grafts may be obtained by cutting off the tip of the cone.) The graft, still on the needle, is transferred to the wound, with raw surface downward. The grafts are placed in rows, a space of not more than 5 mm. being left between the grafts.⁹ When two rows are in place, a strip of dry sterile rubber protective about 1.5 cm. wide is applied over them, so that the lower edge of the protective just covers the lower row of grafts. Then the protective is pressed down over the grafts firmly with a gauze pledget, and the edges of the grafts will uncurl and spread out evenly on the wound. The next row of grafts is placed close to the edge of the protective, and after two or three rows are applied, they are covered with a second strip of protective, which overlaps the first piece about one-half its width. The protective is pressed down firmly, and the procedure is continued in this manner until the whole wound, or the part selected, is covered.¹⁰ The ends of the protective strips which extend beyond the wound edges may be fastened securely to the normal skin by means of a

few drops of chloroform.¹¹ Moist salt gauze over the protective strips secured by a bandage is a satisfactory dressing. The part should also be immobilized as far as possible.

The area from which the grafts are taken may be dressed with boric ointment spread on a sheet of rubber protective, which is snugly strapped over the wound, or with silver-foil and dry gauze.

The grafts are either round or irregularly oval. They vary between 2 and 4 mm. in diameter (Fig. 3), and should seldom be larger than 4 mm. They are thickest in the center and taper off toward the edges. With a sharp knife the size, contour and depth can be judged quite accurately.

The wounds left by the removal of the grafts have the appearance of small pits punched in the skin, there being a rim of untouched epithelium between the pits. Fat may be seen in the bottom of some of the pits, which shows that a considerable depth of the skin is used.

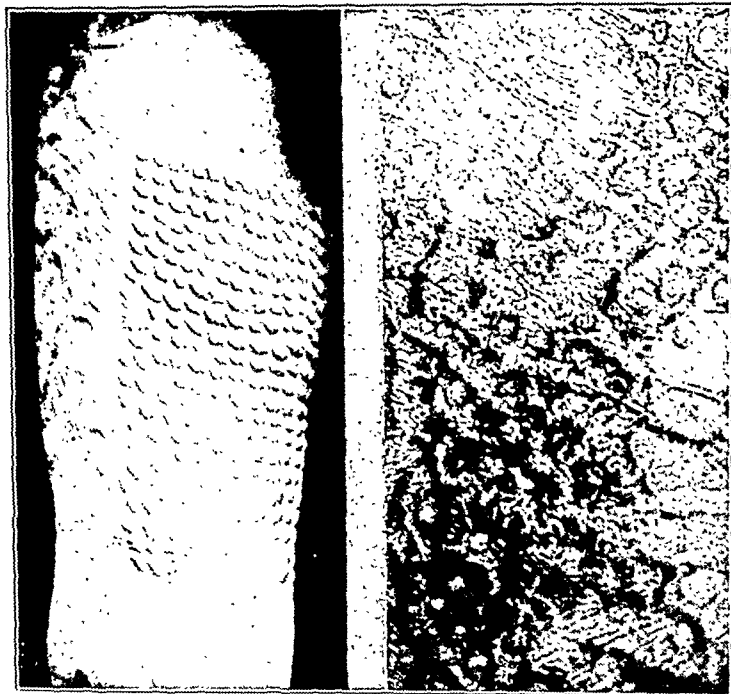


Fig. 4.—A, the development of keloid on the thigh in the wounds from which small deep grafts were cut. All of these grafts were cut at one operation. There was no keloid formation around the grafts. Photograph was taken one year later. B, keloid formation around small deep grafts. The grafts, which are soft and in good condition, can be seen at the bottom of little pits. The development of the keloid around the grafts followed a perfectly flat and apparently normal healing. There was no keloid growth in the scars from which the grafts were cut. Photograph was taken nine months after grafting.

There is more bleeding following the removal of these small deep grafts than when the Reverdin grafts are cut, and the resulting scars are also somewhat more pronounced.

Sometimes when the grafts are small, and the skin blood-stained, it is difficult to determine which is the raw surface. This difficulty is obviated when the grafts are obtained from a negro or when iodine technic is employed.

When a large number of these grafts have to be applied the process is very tedious, but this may be mitigated to a certain extent by having two men cutting the grafts, while one man places them, or vice versa.

11. C. A. Porter of Boston uses crape lisse and collodion to hold grafts in place on small wounds.

6. In a number of instances I have applied several hundred of these grafts at a single operation.

7. Agnew, D. H. (Med. and Surg. Rep., 1874, xxxi, 424), first suggested the use of the needle to raise the bit of skin to be cut in obtaining Reverdin grafts.

8. The use of forceps and scissors in obtaining small grafts is not desirable, as the skin is thereby traumatized unnecessarily.

9. The grafts will spread over a considerably larger area, but I believe that more stable healing is produced when the grafts are placed quite close together than when they are planted with greater intervals between.

10. The overlapping strips of protective allow the escape of any secretions from the wound into the overlying dressings.

POSTOPERATIVE TREATMENT

The patient should be kept in bed for a longer or shorter period, depending on the size and location of the grafted area. The part grafted should be immobilized and protected from injury.

The dressings should be removed on the second or third day, and any wound secretions carefully mopped up, or washed off with a gentle irrigation of normal salt solution.

It is possible, even as soon as this, to tell whether or not the grafts have been successful, and in many instances a narrow ring of new epithelial growth can be seen surrounding each graft.

Some bland ointment on old linen is then applied, and if after a day or two the epithelial growth from

with a dry powder, such as zinc stearate, and exposed to the air.

I have not found the open treatment of these grafts just after application to be satisfactory.

The grafted area should be protected from injury for several weeks. Gentle massage is advisable after about three weeks, and should be continued until the grafted area is as freely movable as the normal skin around it.

There is a marked desquamation of the grafted surface when it dries out, especially between the grafts, which is evidently due to epithelial overproduction, but this scaliness can easily be controlled by the application of olive oil or oil of theobroma (butter of cacao).

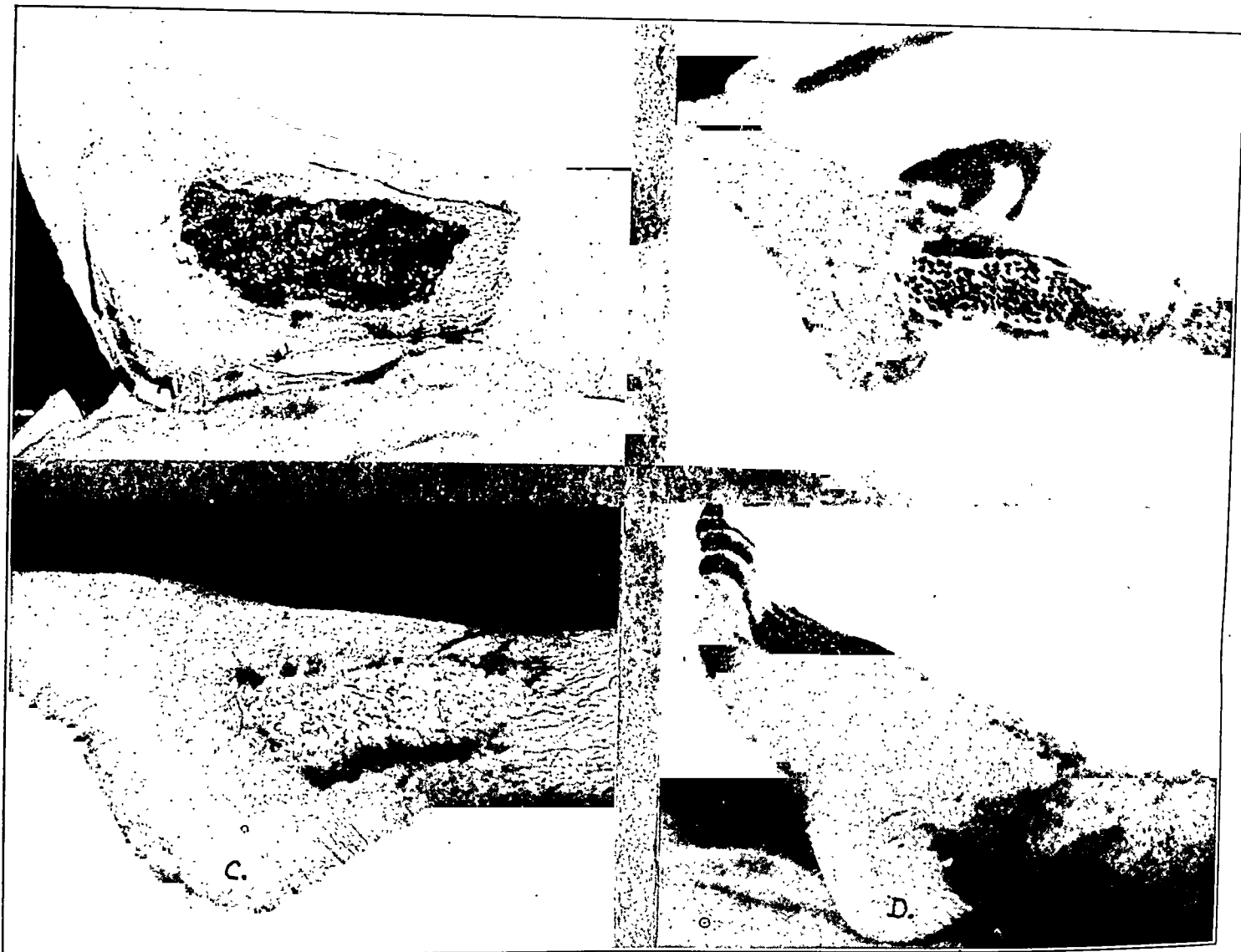


Fig. 5.—*A*, ulcer, seven months' duration, following a streptococcus infection. *B*, one week after grafting with small deep grafts. Note the close proximity of the grafts to each other. Many of them have grown together and also have joined the stimulated skin edges. Shrinkage in the size of the wound is noticeable. *C*, the same wound two weeks after grafting, entirely healed. *D*, the grafted area two years and three months after operation. The individual grafts can be plainly seen and are sharply differentiated from the surrounding scar tissue.

the grafts is not as vigorous as desired, it is well to alternate the bland ointment with scarlet red, 8 per cent., in petrolatum or zinc ointment, or to use some other epithelial stimulant.

The surface from which the grafts are taken should be dressed in three or four days if protective is used, and the area dusted with a dry powder. If silver-foil is used it should not be disturbed for ten days, after which time all dressings may be removed.

As soon as the new epithelium has filled the gaps between the grafts and joined the epithelium from the wound edges, the grafted area may be dressed

UNTOWARD POSSIBILITIES

There are certain untoward possibilities which must be considered. On account of the simplicity of the operative procedure we are accustomed to regard the use of small grafts as attended with no danger and with but few bad results. Aside from contraction, which may occur, we must consider the danger of carrying infection from the granulating surface to the wounds from which the grafts are cut. It is a difficult matter to convey a graft on a needle, or any other instrument, to a granulating wound without occasionally touching the granulations with the instru-

ment. In order to avoid this chance of contamination it is best either to use a fresh needle for each graft, or to have several needles, so that one can be "flamed" while the other is in use.¹²

Another disagreeable occurrence is the formation of keloid (Fig. 4). Occasionally a massive keloid growth will form in the grafted area, and the grafts themselves can be seen at the bottom of little depressions in the keloid. This keloid growth would probably occur in these wounds whether they were grafted or not. Again, keloid may develop in the scars of the wounds from which the grafts are taken. We know that in certain persons there is a tendency to the development of keloid following almost any wound. This is of course especially true among negroes. It has been my experience that keloid develops in white persons, either in the wound itself or in the areas from which the grafts are taken, much more frequently in burns than in large wounds from other causes. Burns caused by acids seem especially prone to be followed by keloid.

COMMENTS

The age of the patient has apparently little effect on the healing of small grafts. The general health should be carefully looked after and when necessary a vigorous building-up treatment inaugurated. Small grafts will often succeed on granulating surfaces under conditions in which no other type of graft could live. There is almost invariably a marked stimulation of the epithelium of the wound edges following the application of these grafts, even though the grafts be unsuccessful.

The shrinkage in the size of the wound after grafting with small grafts is in some cases quite remarkable. Contraction may occur under a grafted area, but it is not nearly so likely as when grafting is not done. If the grafts are placed close together, contraction may be to a large extent prevented. Healing is very much expedited by the use of these grafts, and resulting cicatrix is solid and resistant.

Small deep grafts are apparently not replaced by scar tissue, as they can be demonstrated as definite areas of normal-appearing skin surrounded by scar tissue even after several years (Fig. 5).

A wound grafted with these small grafts, placed at intervals, has a dotted appearance, and the cosmetic result is not so satisfactory as when either large Ollier-Thiersch, or whole thickness grafts, are used. For this reason it is better not to use them on the face, unless especially indicated. However, if the grafts are placed close together, so as to touch each other, the appearance of the grafted area is very much improved.

A brownish pigment sometimes appears in the grafts themselves, as well as in the cicatrix between them. The scars left by the removal of these grafts is after a time scarcely noticeable, except in those instances in which pigmentation occurs.

The sensation of an area grafted with small deep grafts gradually comes in from the periphery, and not from the underlying tissues.

12. The importance of this point was impressed on me by the following incident: A very resistant ulcer of the groin of long standing, the etiology of which could not be definitely determined, was grafted with small grafts. The wounds from which the grafts were taken on the thigh became infected, and when I was called to see the patient a week afterward, an ulcer similar to that in the groin had developed. This ulcer also resisted every method of treatment used, and it was finally necessary to excise the entire area with a liberal margin. The defect, which was 11 cm. in diameter, and down to the deep fascia, was immediately grafted with a Thiersch graft and healed promptly.

The procedure is by all odds the simplest method of grafting. It requires little preliminary preparation after the granulations are in condition, and unless the area to be grafted is large, the grafting can be done in the patient's room. Enough autografts can be obtained from a small area to cover a large wound without causing any appreciable injury to a patient already in a serious condition.

Several patients have come under my care whose lives have undoubtedly been saved by the successful use of these small grafts.¹³

The difference in the ultimate result between small superficial grafts and small deep grafts placed close together is almost as marked as the difference in results between Ollier-Thiersch grafts and whole thickness grafts.

INTRINSIC CANCER OF THE LARYNX

COMPLETE EXCISION APPARENTLY EFFECTED BY ENDOLARYNGEAL OPERATION

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LONDON, ENGLAND

The treatment of intrinsic cancer of the larynx by laryngofissure is remarkably satisfactory. It is doubtful if the results of operation for cancer in any other part of the body can surpass those which I have already reported.¹ Since giving full particulars and showing cases before the Medical Society of London in 1912, I have continued to obtain the same results; that is, no patient has been lost by operation, and 80 per cent. have remained free from recurrence. This freedom from recurrence dates back in some cases for ten years.

The same proportion of lasting cures was obtained by Semon, who did much to popularize laryngofissure in these cases, and similar records were secured by Butlin, who revived the operation after it had been quite discredited both in this country and abroad. Possibly it is because these excellent results were first obtained in England that we, in this country, have come to look askance at any other route for removing an endolaryngeal cancer except that obtained by splitting the larynx. We are even a little skeptical in accepting the records which claim permanent cures by operating through the mouth; yet reports of such cases have been published by several eminent authorities.²

Among my recent cases it has been my good fortune to obtain, in a curious way, the definite proof that an intrinsic cancer of the larynx can be completely removed *per vias naturales*. But I hasten to add that the completeness of removal was unintentional and that I do not for a single moment suggest that excision

13. I have in mind an illustrative case. A child, aged 12, was severely burned over the pelvis, thighs and legs. She came under my care nearly a year after the accident, during which period she had been repeatedly grafted without success. Her condition was desperate. She was delirious, extremely emaciated and generally depleted by the pain, and by the long-standing suppurating wounds. As a last resort the wounds were grafted with small deep, autografts, which were successful, and within a few days the change in her condition for the better was astonishing. A prompt recovery followed. No other type of autograft could have been successful in this case, on account of the condition of the granulations.

1. Thomson, St. Clair: Brit. Med. Jour., Feb. 17, 1912, p. 355.
2. Fraenkel, B.: Deutsch. med. Wchnschr., xv, 1; Arch. f. Laryngol., 1897, vi, 361. Arslan: Arch. Ital. di Otol., 1901, xii, Part 2; Ann. des mal. de l'oreille, 1904, xxx, 130. This gives an analysis of recorded cases. In two personal cases, confirmed by the microscope, the patients remained well after four years and twenty months, respectively. Funder: Jour. Laryngol., 1910, xxv, 602.

of a cancer of a vocal cord should ever be confided to the laryngeal forceps. On the contrary, this very case which I am about to relate, gives the strongest proof of the desirability and hopefulness of treating intrinsic laryngeal cancer by opening the larynx from the outside. It was the first case of endolaryngeal cancer which I have handled in a woman; all my other patients were males.

Mrs. A. P., aged 53, had been hoarse for eight months when she was sent to me at King's College Hospital, Oct. 12, 1912, by Dr. Shaw of Great Yarmouth. The right vocal cord from the anterior commissure back to the vocal process was replaced by a reddish, cauliflower growth (Fig. 1). This

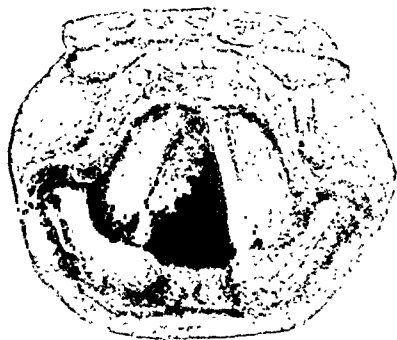


Fig. 1.—Intrinsic cancer of the larynx. Epithelioma of the right vocal cord.

somewhat interfered with the movement of the cord, but its intrinsic mobility was not impaired. There were no enlarged glands and the case was evidently a very suitable one for operation by laryngofissure. The Wassermann reaction was negative and the chest was healthy.

As the growth did not infiltrate the cord to any great extent (as shown by the persistence of mobility), and as it projected well above the surface, I decided to remove a portion so as to confirm the diagnosis by microscopic examination. With the aid of cocaine, and using a large-sized duck-billed forceps of Morell Mackenzie, with the indirect method, I seized as large a piece of the cord as possible, and, finding it very tough, I removed it by avulsion. The toughness and naked-eyed appearance were confirmatory of my diagnosis of malignant disease, and the following report on the removed tissue was kindly furnished by Dr. d'Este Emery:

"The material is an irregular mass about 9 by 5 mm. It is divided into two parts, of which one consists of papillomatous and epitheliomatous tissue, with a very small amount of fibrous stroma which shows evidence of subacute inflammatory changes. The large portion consists of a firm fibrous basis. On one edge there are some mucous glands. On the other two unattached edges, there is a margin of epitheliomatous tissue which in places is inflamed and ulcerated.

"The epithelioma in this section is a typical one but shows little keratinization. There are a few imperfectly formed cell-nests, and some so-called 'cancer parasites.'"

Nov. 28, 1912, anesthesia was induced by Dr. Silk by intravenous infusion of ether and hedonal, administered through the internal malleolar vein. The usual laryngofissure operation was carried out; no Hahn's tube was used. The remains of the right cord and the ventricular band were dissected up with their perichondrium from the inner surface of the thyroid cartilage and removed *en masse* together with the vocal process of the arytenoid cartilage. The tracheotomy-tube was removed before the patient left the table. She would have been allowed up the next day, but she was exceedingly drowsy from the hedonal and could hardly be roused. Within forty-eight hours of the operation, however, she was sitting out of bed and eating solid food. She returned to the country a fortnight after operation.³

The tissue removed by laryngofissure was submitted to Dr. Emery, who reported on it as follows:

"The specimen is of an irregular shape, the longest dimensions being 19 by 10 mm. The base consists of striped muscle which is inflamed and edematous; some mucous glands occur in the lowest portion. Above this there is a layer of organizing granulation-tissue in various stages, but there is no epithelial covering. Mucous glands, normal or slightly inflamed, are scattered throughout the section, and at one end there is a triangular piece of cartilage about 2.5 mm. long.

"There is no sign of epithelioma or other malignant disease in any other part of the section."

This report brings us to the instructive conclusions which may be drawn from this case. To be brief, I will simply state them in order.

1. Cancer of the vocal cords, is, in early stages, a very slowly progressive and strictly limited process. (In this case hoarseness dated from eight months, the cord was still quite mobile, and the disease was still superficial.) Alteration of voice is the principal and may be the only symptom. Persistent hoarseness in any patient calls for a definite diagnosis.

2. Diagnosis is based chiefly on inspection of the larynx. Only in certain cases in which the growth is a superficial and not an infiltrating one can it be confirmed by microscopic examination.

3. The growth, even when it occupies almost the entire length of a vocal cord, can sometimes be completely removed by endolaryngeal operation in early cases. But this completeness can be ascertained only when, by laryngofissure, the remains of the vocal cord and adjoining soft parts have been removed and submitted to the pathologist.

4. Laryngofissure is, therefore, the operation of choice in all cases of endolaryngeal cancer.

5. The operation offers the very best prospects, first, because the disease remains for some time superficial and limited, and secondly, because laryngofissure cannot be considered a dangerous operation.

6. Statistical results show a lasting cure in 80 per cent. of cases, and if all patients presented themselves and cases were diagnosed early there is no reason why the results should not be even more satisfactory.

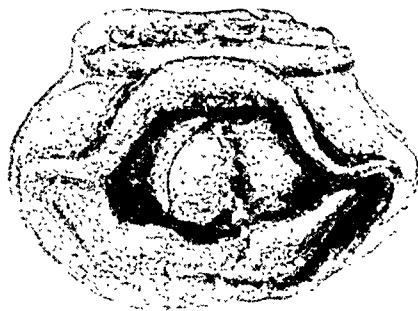


Fig. 2.—Intrinsic cancer of the larynx after operation by laryngofissure, showing a large (innocent) granuloma.

My patient is in good health, with a useful voice, and has had no recurrence at the present date, that is, one and a half years after operation.⁴

I have already confirmed the opinion originally enunciated by Semon that if recurrence does not take place during the first year after operation there is every prospect of permanent cure.

ADDENDA

In addition to the six conclusions tabulated above this case suggests three other interesting points.

4. The patient was shown before the Clinical Congress of American Surgeons, in London, July 28, 1914.

3. The patient was shown before the Clinical Section, Royal Society of Medicine, Feb. 14, 1913.

1. *Regrowth*.—Toward the end of January, 1913, that is, two months after operation, the patient began to show symptoms of what many would have taken to be a recurrence of the growth (Fig. 2). But I had no anxiety myself, partly on account of the foregoing negative report from the pathologist, but chiefly from experience with previous cases in which a regrowth during the first two months nearly always proved to be a simple granuloma. In this case the fresh neoplasm was removed entire through the mouth with the same Mackenzie forceps, and by indirect laryngoscopy, and was found to consist of simple granulation-tissue, showing no epithelioma or sign of malignant disease in any part of the section.

The moral of this is, that a regrowth in early days after a thyrotomy for cancer is not necessarily malignant.

2. *Value of Indirect Laryngoscopy*.—The case shows that a considerable growth, indeed, practically an entire vocal cord, can be removed with one bite of the forceps used by the indirect, or, as some already call it, the "old method" of laryngoscopy. As I have practiced Killian's direct laryngoscopy for eleven years, I feel equally skilled with the two methods, and each method has its own well-marked indications. I very much doubt if the most expert endoscopist could have removed as large a growth as I did in this case, and certainly it could not have been done more quickly or less disagreeably. The indirect method allows of the forceps being sloped to the opposite side of the body, so that any growth on a cord can be more cleanly and completely seized than is possible with the limited action of cutting forceps working in a circumscribed, circular tube. The importance of removing as large and intact a portion of growth as is possible is of the highest value when it is desirable to submit a suspected neoplasm to the microscope. It will be a loss to laryngoscopy, and to our patients, if the rising generation of throat surgeons neglect to acquire the gentler art of indirect laryngoscopy and limit themselves to the easier but rougher technic of direct examination.

3. *Anesthesia*.—Laryngofissure can be well carried out under local anesthesia. I have employed it in one successful case, but I doubt if many of our sensitive patients in this country would submit to the moral ordeal. In the foregoing case the operation lasted eighty-five minutes. Anesthesia was induced by a mixture of 1 ounce of ether and 20 grains of hedonal to a pint of normal saline solution, the object of the hedonal being to diminish as far as possible the total amount of fluid passed into the circulation. Two pints and 6 ounces of this mixture were used, corresponding to 2 ounces $2\frac{1}{2}$ drams of ether and 46 grains of hedonal, including a certain amount of wastage. Probably 2 ounces of ether and 40 grains of hedonal were infused through the internal malleolar vein. As administered by Dr. J. F. W. Silk, the resulting anesthesia was, from the operator's point of view, perfectly ideal. The field of operation was quite clear of the anesthetist and his paraphernalia, and the patient's sleep was tranquil and even.

But the profound sleep in which she continued to be plunged next day gave me some anxiety. For twenty-four hours it was difficult to arouse her, and I thought what a serious condition might have arisen if, peradventure, she had inspired any blood during the operation and we had wished her to cough up the resulting bronchial or pulmonary catarrh.

I would suggest that in future cases the hedonal be reduced to a minimum, if it cannot be dispensed with.

In another case I had there was some thrombosis of the lower part of the internal saphena vein, and this kept the patient in bed when he ought to have been up and about.

Besides, I am not quite sure whether it is wise to flood the circulation with over 2 pints of liquid, and it is difficult to keep within the limit unless some such drug as hedonal be employed with the corresponding tendency to prolonged and profound after-sleep.

Anyhow, the method of anesthesia by intravenous infusion of ether has not yet established itself in my opinion, for these cases, and it still requires consideration. In my more recent cases I have returned with satisfaction to the use of chloroform employed in the usual way.

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SARCOID OF BOECK *

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MINNEAPOLIS

Kaposi¹ first grouped mycosis fungoides, lymphoderma perniciosus, sarcomatosis cutis and the real sarcomas of the skin in a class which he called sarcoïd. Spiegler² and Max Joseph³ did some early work on the subject. Fendt⁴ classed as sarcoïd, "tumors of benign prognosis, having only a limited growth, frequently healing with arsenic, composed of groups of round cells, which are circumscribed, divided by septa and encapsulated."

Boeck⁵ in 1899 reported as multiple benign sarcoïd a new disease of characteristic clinical and histologic appearance. In later articles Boeck⁶ reported a series of cases and added a new type of the disease, the diffuse infiltrating type.

The work of Boeck caused many cases to be reported in the European literature but in America the only cases are those of Gottheil,⁷ Pollitzer⁸ and Sutton.⁹ G. H. Fox and Wile¹⁰ reported an atypical case and Howard Fox¹¹ reported one composed histologically of round cells, so that it is not a sarcoïd of Boeck. Darier and Roussy¹² in 1904 described a subcutaneous sarcoïd closely resembling Boeck's sarcoïd. Darier¹³ in 1910 made an extensive study of the entire group of sarcoïds. He divided the group into four types, as follows:

1. Multiple benign sarcoïd of Boeck.
2. Subcutaneous sarcoïd of Darier-Roussy.
3. Erythema induratum-like sarcoïd of the extremities.

* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Kaposi, M.: *Lehrbuch der Hautkrankheiten*, Ed. 5, p. 909.
2. Spiegler: *Arch. f. Dermat. u. Syph.*, 1894, xxvii, 163.
3. Joseph, M.: *Arch. f. Dermat. u. Syph.*, 1898, xli, 177.
4. Fendt: *Arch. f. Dermat. u. Syph.*, 1900, liii, 213.
5. Boeck, C.: *Jour. Cutan. Dis.*, 1899, xvii, 543.
6. Boeck, C.: *Ergänzungsband zum Arch. f. Dermat. u. Syph.*, 1900, p. 153; *Arch. f. Dermat. u. Syph.*, 1905, lxxiii, Nos. 1-3, p. 71.
7. Gottheil, W.: *Jour. Cutan. Dis.*, 1902, xx, 400.
8. Pollitzer, S.: *Jour. Cutan. Dis.*, 1908, xxvi, 15.
9. Sutton, R. L.: *Dermat. Wechnschr.*, 1914, lvi, 537.
10. Fox, G. H., and Wile, Udo: *Jour. Cutan. Dis.*, 1911, xxix, 375.
11. Fox, Howard: *Jour. Cutan. Dis.*, 1914, xxxii, 124.
12. Darier, J., and Roussy, G.: *Ann. de dermat. et. de syph.*, 1904, v, 144.
13. Darier, J.: *Monatschr. f. prakt. Dermat.*, 1910, 1, 419.

4. Spiegler-Fendt type. Non-tuberculous, composed of round cells. Resembles neoplastic lymphoderma.

Boeck's sarcoid or miliary lupoid, as he later called it, has three forms: (1) large nodular; (2) small nodular or papular; (3) diffuse infiltrating. The lesions may vary in number from one only, as in the

the urine and blood are normal. It occurs more often in women than in men (Fox and Wile¹⁰). It may occur, according to Boeck, from the thirteenth to the forty-fifth year, but cases have been reported earlier (Sutton⁹ and later Mazza¹⁹). Rather typical in the disease is the involution of the nodules under prolonged arsenical medication.

The histologic picture is characteristic. "One look in the microscope suffices to make a diagnosis," according to Darier.¹⁵ Sections show sharply circumscribed, deep-seated nodules, separated by connective-tissue septa which seem to have been pushed aside by the growing tumor. The cells are epithelioid with pale-staining nuclei. At the edges are seen a few lymphocytes, giant-cells and rarely giant-cells of the true Langhans type.

The elastic tissue is absent in the nodules but present in the septa. There are no leukocytes present, as a rule, and there is never any evidence of caseation. Blood-vessels can be seen in the nodules.

The Darier-Roussy type of subcutaneous sarcoid is very rare. Three cases were recorded by Darier in 1910. They consist of round or oval subcutaneous nodules from the size of a hazelnut to a walnut. They are few and are located on the back of the trunk. There is no tendency to ulceration and no influence on the general system. Histologically they are situated in the subcutis, composed of epithelioid-cells and new connective-tissue cells and lymphocytes; numerous giant-cells are seen and a few plasma-cells, mast-cells and leukocytes. It differs from Boeck's in its appearance, its size, its subcutaneous location, and also looks

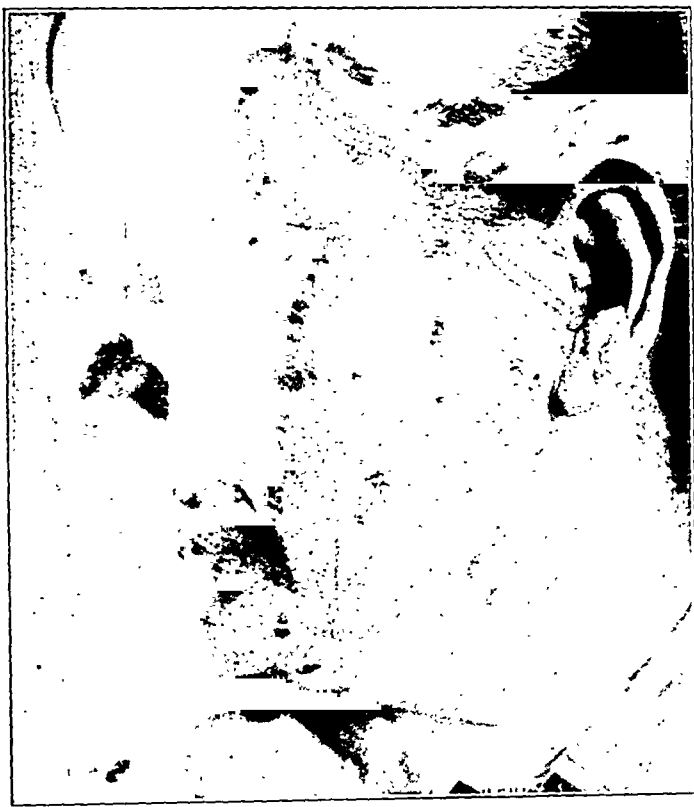


Fig. 1.—Sarcoid of Boeck.

cases of Kreibich and Kraus¹⁴ and Urban,¹⁵ or run into many thousands, as in the case of Hallopeau and Eck.¹⁶ It is located on the face, back, shoulders and extensor surfaces of the arms, but can occur on the scalp and lower extremities. Boeck asserted that the soles of the feet were not involved. Wolfheim¹⁷ reported a case where the soles were involved.

It may begin suddenly with a diffuse edematous reddening and after from eight to fourteen days disappear and leave one or more circumscribed infiltrated areas. More often it begins as a little round nodule, deep in the cutis and as it approaches the epidermis lifts it up. The nodules grow very slowly, come out in crops and last months and even years. They feel larger than they look, according to Unna.¹⁸ They are red at first, later red-violet, then yellowish and finally brownish. They feel hard, and often, on pressure with glass, show minute yellow foci. This led to the name "miliary lupoid." This is seen at the time of retrogression. As retrogression occurs the nodules become depressed in the center and a fine network of telangiectatic vessels run over the edge; sometimes a fine scale forms. The nodule or papule may completely disappear and leave a pigmented spot or an atrophic scar with telangiectatic vessels over it. It never softens or ulcerates. The mucous membrane is sometimes affected. The lymphatic glands may or may not be enlarged. The general condition is not influenced by the disease, and

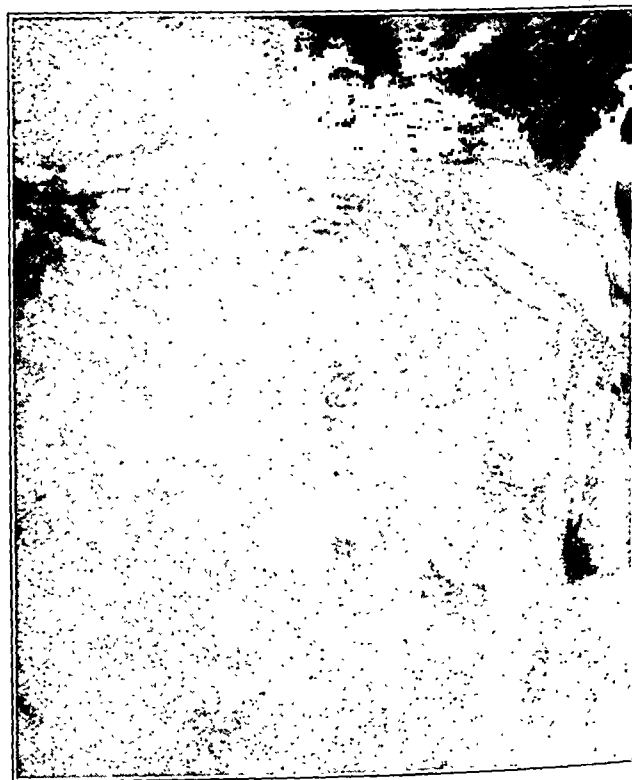


Fig. 2.—Enlargement showing individual lesions.

more tuberculous. It is less sharply defined and more infiltrating.

The third group of Darier, the sarcoid of the extremities resembling erythema induratum, is more frequent, and occurs mostly in women. It consists of nodules with circumscribed thickening and hardening of the

14. Kreibich and Kraus: *Arch. f. Dermat. u. Syph.*, 1908, xcii, 173.
15. Urban, O.: *Arch. f. Dermat. u. Syph.*, 1910, ci, 175.
16. Hallopeau and Eck: *Ann. de dermat. et de syph.*, 1902, iii, 935.
17. Wolfheim, R.: *Ikongraphia Dermat. Fasc.*, vi, 255.
18. Unna, P., Jr.: *Dermat. Wehnschr.*, 1912, lv, 1203.

19. Mazza, G.: *Arch. f. Dermat. u. Syph.*, 1908, xci, 57.

cutis and subcutis. They are painless, seldom soften and ulcerate and are generally located on the extensor surfaces of the extremities. They are from the size of a pea to that of a hazelnut.

Pelagatti,²⁰ Thibierge and Bord²¹ and Darier himself reported cases of this type. Many authors look on this as erythema induratum on account of the occasional ulceration, positive tuberculin reaction and the few cases of Carle,²² Thibierge and Ravaut,²³ Colcott Fox²⁴ and Schidachi,²⁵ in which tuberculosis was demonstrated in inoculated animals. Philippson²⁶ demonstrated tubercle bacilli in the sections.

The fourth type, or sarcoid of Spiegler-Fendt, shows no relationship to tuberculosis, but is composed of round cells and is probably related to the neoplastic lymphoderma. This type shows nodules in the cutis, the skin is rose, lilac or dark red in color. It is located on the body, is chronic in course and has no tendency to ulceration. It is usually affected by arsenical medication. Histologically the lesions are composed of

cases reported by Darier-Roussy and one of his own are the only cases reported so far of Type 2, and questions if this type really does not belong to erythema induratum. Volk reports a case of subcutaneous sarcoid in which he obtained the tubercle bacillus in a guinea-pig and produced tuberculous iritis in rabbits' eyes.

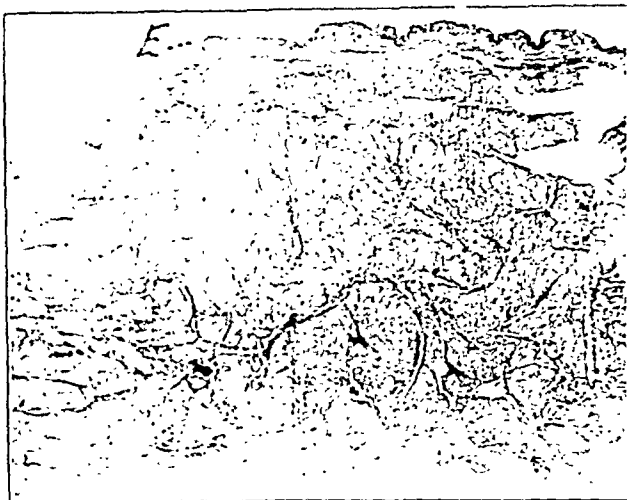


Fig. 4.—Section of tumor under very low magnification; E, epidermis.

REPORT OF CASE

The following case of Boeck's sarcoid came under my observation early in 1914. The patient was sent into the University Hospital by Dr. A. W. Shaw of Buhl, Minn., being referred to me by Dr. F. R. Wright.

Patient.—Mrs. H. G., Swedish, aged 53; large and well nourished. Weight 169. Eruption began three years ago, first being manifest in the scalp, then the face was affected and finally the back and arms.

Macroscopic Examination.—The scalp shows no new lesions but eight areas of irregular shape and size, somewhat depressed and slightly scaly. The face and forehead show



Fig. 5.—Portion of lower part of tumor under higher magnification.



Fig. 3.—Back showing depressed areas.

round cells more or less circumscribed and sometimes encapsulated. Epithelioid and giant-cells are either absent or very scanty. Probably many cases of sarcoma of the skin reported as cured belong to this group.

In regard to Darier's classification, Nobl²⁷ asserts that the subcutaneous sarcoid and erythema induratum are identical. Volk²⁸ in a recent article says that Type 4 can be dropped, as this class belongs to the neoplastic lymphoderma. Type 3, Volk, in agreement with others, classes as erythema induratum. This leaves only Types 1 and 2, and he asserts that the

about thirty lesions, some new, some old. They begin as a small, round, freely movable tumor deep in the skin and eventually involve the epidermis, lifting it up in a nodule, red at first, later red-violet, and as they get older more of a brownish-yellow. Finally the nodule becomes depressed in the center and shows a small white scale. Over the edges of many of the old lesions is a fine network of telangiectatic vessels. These old lesions are some small singular ones of the size of a grain of wheat and others seem to be formed of

20. Pelagatti: Gior. ital. d. mal. ven., 1907, xlviii, 425.

21. Thibierge and Bord: Ann. de dermat. et de syph., 1907, viii, 113.

22. Carle: Lyon méd., 1901, xvi, 358.

23. Thibierge and Ravaut: Ann. de dermat. et de syph., 1899, x, 513.

24. Fox, Colcott: Brit. Jour. Dermat., 1893, v, 225.

25. Schidachi: Wein. klin. Wchnschr., 1913, xxvi, 1425; referred to by Volk (Note 28).

26. Philippson: Gior. ital. d. mal. ven., 1898, xxxiii, 61.

27. Nobl, G.: Wien. med. Wchnschr., 1913, lxiii, 2341.

28. Volk, R.: Wien. klin. Wchnschr., 1913, xxvi, 1425.

a group of these small lesions and are therefore polycyclic in shape. At the nasolabial fold are a few younger lesions lighter in color and not depressed. There is no evidence of any pus or caseation in any of these lesions. On pressure with a glass it is possible to make out minute round yellowish foci. On the back there are about fifty lesions, most of them evidently having undergone resolution. The new ones start as round hard nodules very deep in the subcutaneous fat. As they grow older they flatten out and lift up the epidermis in a hard, firm, elevated, flat brownish-red lesion. Evidently an atrophy finally takes place and the lesions heal, leaving a soft depressed bluish area, covered with dilated capillaries. There are no scales present on the back. The breast and upper arms show a few isolated lesions, one or two of which show a fine

separated by connective-tissue septa. The cells of the tumor were epithelioid with pale-staining nuclei. A few lymphocytes were seen at the edges. In the tumor from the back were giant-cells of the true Langhans type. Elastic tissue was absent from the tumor but present in the septa. No tubercle bacilli were found in any of the sections and no evidence of caseation or necrosis was seen.

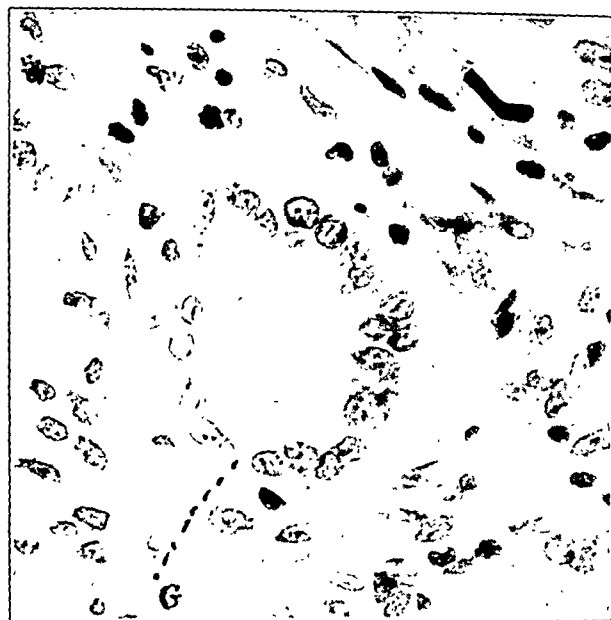
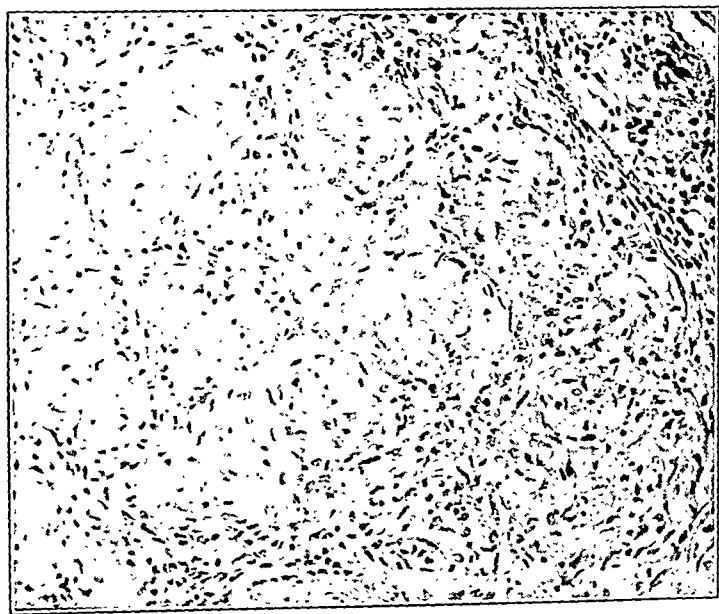


Fig. 8.—Langhans type of giant-cell.



Figs. 6 and 7.—Still higher magnification of tumor.

scale. The mucous membrane of the nose and mouth is not involved. The glands are not enlarged.

Two subcutaneous injections of tuberculin gave no local or general reaction. Wassermann reaction was negative. Blood and urine normal. A small section was cut from a lesion on the face for microscopic study. Two large pieces were cut from the back to obtain more material for histologic study and animal and cultural experiments.

Microscopic Examination.—Histologically the tumors on the face and back were identical with the exception that the one from the back showed more giant-cells. The epidermis was normal. The papillary layer was unchanged except where the tumor encroached on it in some sections; there it was flattened a little. The tumor was situated deep in the dermis and consisted of a number of round or rounded areas

Animal Experiments.—Two rabbits and four guinea-pigs were inoculated intraperitoneally with pieces of tissue from the tumor. One guinea-pig which died of some intercurrent disease ten weeks after inoculation showed at post-mortem several small firm nodules in the omentum. No parasitic diseases were found to account for these nodules. Examined microscopically the structure strongly suggests healed tubercles. While these lesions cannot be taken as positive proof of healed tuberculosis they are best explained by this interpretation. They are about the type of lesions one would expect to see as the result of infection with tubercle bacilli of

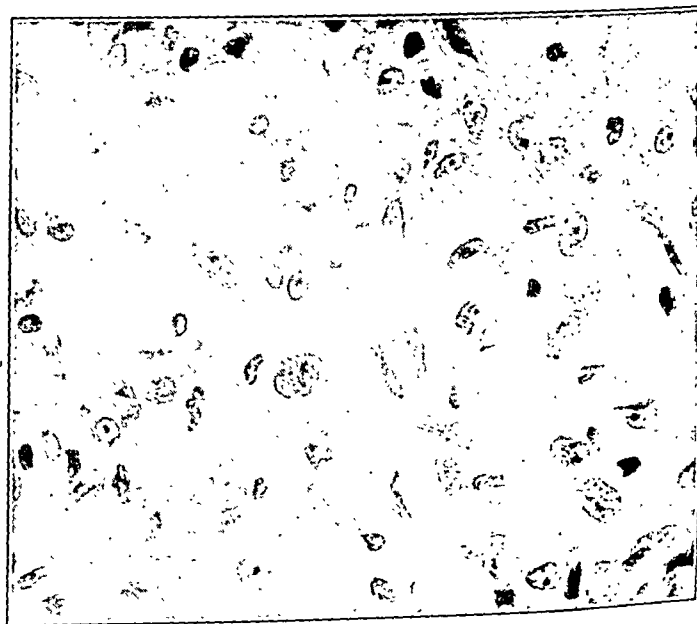


Fig. 9.—Epithelioid cells highly magnified.

low virulence. All the ordinary media were inoculated with material from the tumor on the back. No growth was obtained either aerobically or anaerobically.

ETIOLOGY

The etiology of Boeck's sarcoid is of interest. Boeck himself thought it to be an infectious bacillary dis-

SARCOID OF BOECK—SIVEITZER

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DIAGNOSIS AND PROGNOSIS

A clinical diagnosis must always be confirmed by the microscope. Clinically, leprosy, lupus vulgaris, lupus erythematosus, leukemia cutis, syphilis, erythema induratum and lupus pernio must all be considered. The prognosis as regards life is good. Recurrences are common, however.

Therapeutically arsenic has given good results in many cases. My patient has, according to a recent letter, improved very much while taking Fowler's solution. Darier has recommended calomel and tuberculin.

The histologic work in this case was done by Dr. E. T. Bell, assistant professor of pathology in the University of

case which is identical or closely allied to tuberculosis. Darier classed it as a tuberculid. Winkler²⁹ analyzed seventeen cases and found that six patients had sure signs of tuberculosis, seven had swollen glands and four no signs of tuberculosis at all. Darier, Kreibich and Kraus, Opificius³⁰ and Stimpke³¹ had cases in which a local reaction was produced by tuberculin. Kren and Weidenfeld³² inoculated twelve guinea-pigs and had no successful results and none of the guinea-pigs reacted to tuberculin given one or two months later. Morawetz³³ in 1909 reported a case of Boeck's sarcoid in which Boeck personally confirmed the diagnosis. There was no local or general reaction to tuberculin. A guinea-pig inoculated, however, was dead in ten days from tuberculosis and tubercle bacilli were recovered. Kyrle³⁴ in 1910 reported a case of Boeck's sarcoid in which animal inoculation was successful in one guinea-pig after ten months. Kyrle³⁵ even goes so far as to suggest the name of tuberculosis cutis typus Boeck, considering all cases of Boeck's sarcoid as due to tubercle bacilli. Pohlmann³⁶ inclines to the belief in the tuberculous nature of the disease. Oppenheim³⁷ in 1913 reported three cases of tumors deep in the skin. These tumors appeared after hypodermic injections and gave a histologic picture that was identical with sarcoid of Boeck. He thinks that not all cases of sarcoid are due to tuberculosis but that some other organism may occasionally cause it. Urban³⁸ agrees with Kreibich and Kraus¹⁴ in considering that there are two varieties of the disease, one related to tuberculosis, the other group having nothing whatever to do with it. Kren³⁸ in a recent communication considers Boeck's sarcoid a tuberculosis of low virulence, but says that as yet this view has not been generally accepted in the literature. With regard to the scant

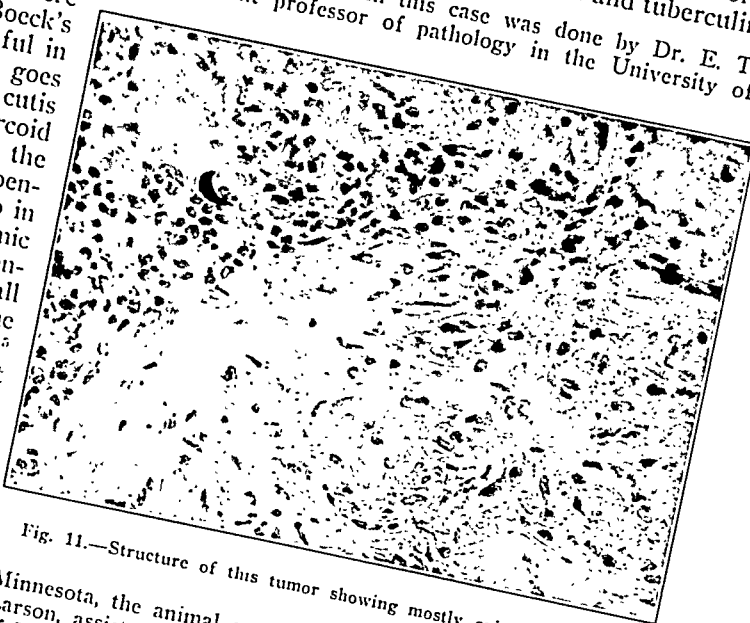


Fig. 11.—Structure of this tumor showing mostly epithelioid cells.

Minnesota, the animal experiments were done by Dr. W. P. Larson, assistant professor of bacteriology of the University of Minnesota, to both of whom I am indebted for kindly aid and advice.

625 Syndicate Building.

ABSTRACT OF DISCUSSION

DR. HOWARD FOX, New York: I have had an opportunity to study a case of this affection reported by my father, Dr. George Henry Fox, in conjunction with Dr. Udo J. Wile, as well as one of my own published last year in the *Journal of Cutaneous Diseases*. In my case it was practically impossible to arrive at a positive diagnosis, as the patient, a young lady, refused to have a biopsy performed. The nearest approach to a diagnosis, after the patient had been seen by many of the best dermatologists in New York and Philadelphia was that it was an atypical case of lupus vulgaris. As a result she was treated with a Finsen-Reyn lamp, operated by a skilled graduate of the Finsen Institute, for a total of about a hundred and fifty hours. After this treatment the eruption on one side of the face almost entirely disappeared, leaving, however, a marked depression. The other side of the face proved entirely refractory to the Finsen therapy and was later treated by Dr. Fred Wise with carbon dioxide snow. This was followed by a complete disappearance of the lesions with a perfect cosmetic result. As a result of this experience I would certainly urge the use of carbon dioxide snow for the treatment of other cases of sarcoid.

DR. F. W. CREGOR, Indianapolis: I report a case which I regarded as one of sarcoma cutis, basing this diagnosis on the picture of a similar case presented by Ehrmann in Vienna three years ago. My patient was a bachelor, 46 years old, who at the age of 11 first noticed dark-red, oval elevations, varying in size from a split pea to a large hazel-nut. The color of the lesions ranged from dark-red to bluish-black, with sharply defined lines of demarcation, and the

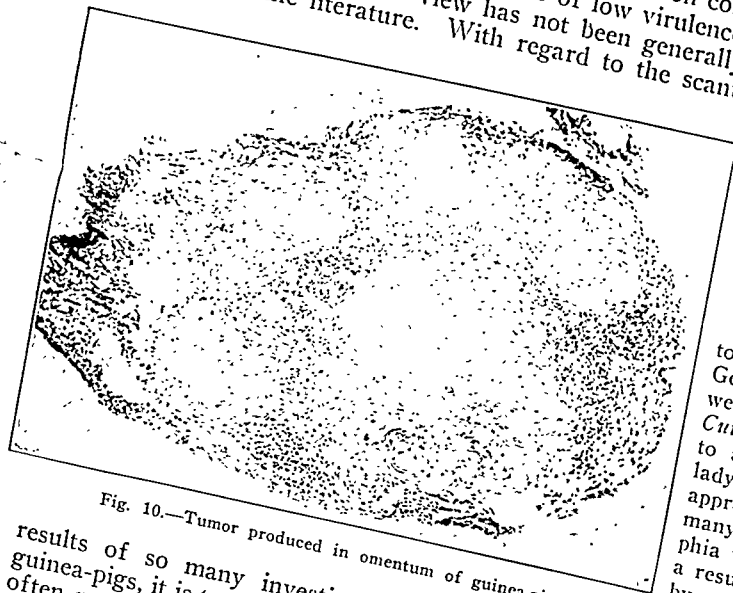


Fig. 10.—Tumor produced in omentum of guinea-pig.

results of so many investigators on inoculation of guinea-pigs, it is true that a bacterium of low virulence often may not take in a guinea-pig and at times may take and later become fibrosed as apparently happened in my case.

29. Winkler, M.: Arch. f. Dermat. u. Syph., 1905, lxxvii, 3.
30. Opificius: Arch. f. Dermat. u. Syph., 1907, lxxxv, 239.
31. Stimpke, G.: Dermat. Ztschr., 1913, xx, 199.
32. Kren and Weidenfeld: Arch. f. Dermat. u. Syph., 1909, xcix, 79.
33. Morawetz: Arch. f. Dermat. u. Syph., 1910, cii, 121; referred to by Pohlmann (Note 36).
34. Kyrle: Arch. f. Dermat. u. Syph., 1910, c, 375.
35. Kyrle: Dermat. Wechschr., 1913, lvii, 1445.
36. Pohlmann, A.: Arch. f. Dermat. u. Syph., 1910, cii, 109.
37. Oppenheim, M.: Dermat. Wechschr., 1913, lvii, 1289.
38. Kren, Otto: Personal communication.

elevations were at all times very perceptible, and always rising gradually. The patient consulted many physicians, none of whom ever ventured a diagnosis. The family history was negative for any skin disease, and there was no personal history of syphilis or tuberculosis, nor did a careful examination reveal any clinical evidence of either of these diseases. The patient said he had long ago learned that by making an incision into these elevations with his pen-knife, they would rapidly disappear, leaving a smooth, pigmented spot. The privilege of a biopsy has not been granted, but it is promised in the near future, when I hope to make some further studies in connection with this interesting case.

DR. S. E. SWEITZER, Minneapolis: I wish to lay particular emphasis on the etiology of this condition. The conflicting views that have been held are gradually clearing up, and there are types of scroloid that are probably a form of tuberculosis of the skin, as my case shows. The case mentioned by Dr. Howard Fox may have had an entirely different etiology.

NEURASTHENIA AND TUBERCULOSIS (CONCEALED)*

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MINNEAPOLIS

Neurasthenia is defined as a condition of exhaustion in the general nervous system. No clear-cut symptom type has ever been described which could identify it and separate it from other diseases, the pathology and etiology of which are known. No specific cause or definite lesion in the brain, spinal cord, peripheral nerves or other organs or tissues of the body have been discovered which would serve to establish a definite pathology for it and thus distinguish it from other diseases the pathology of which is known.

Resting on no etiologic, pathologic or distinctly clinical foundation, the question may pertinently be asked—why does neurasthenia still retain its place as a clinical entity and why do clinicians persist in making the diagnosis of neurasthenia?

Because after the cases of recognizable organic disease simulating neurasthenia have been excluded from the group, a good number remain in which clinicians can detect no tuberculosis, no syphilis, no gastric ulcer, no nephritis, no organic heart-disease, no exophthalmic goiter or other organic disease.

That the limitations of our diagnostic resources may be responsible for this is quite probable because the Wassermann reaction has helped to exclude from the group of so-called neurasthenias many cases of concealed lues; the Roentgen ray has subtracted a number by revealing the presence of unrecognized gastric ulcers, and the more recent methods of cardiac examination and diagnosis have taken out a not inconsiderable number of cases of organic heart-disease.

If it can be shown that many of the so-called pure neurasthenias harbor a tuberculous infection so concealed as to have hitherto escaped recognition, the death knell of neurasthenia as a clinical entity must be sounded.

The close relationship between neurasthenia (so-called) and tuberculosis has long been recognized and commented on.

* Read before the Section on Practice of Medicine at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

* Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

Stiller¹ devotes a whole chapter to the subject.

Lawrason Brown has emphasized the fact that in no disease is the neurasthenic state so frequently encountered as in tuberculosis.

It is not my intention to discuss the relationship between neurasthenia and clinically demonstrable tuberculosis, nor do I intend to consider the cases of clinically recognizable tuberculosis exhibiting neurasthenic symptoms.

The purpose of this study is to present evidence to prove that:

1. Many cases of clinically pure neurasthenia harbor tuberculous lesions so concealed as to escape detection by the examination methods usually employed.

2. No organic disease except tuberculosis can be discovered in these cases.

3. The diagnosis of tuberculosis rather than neurasthenia should be made in these cases.

4. The nervous symptoms exhibited by these patients should be interpreted as a new clinical symptom type for tuberculosis produced by the toxin of the tubercle bacillus.

In proof of this contention I here present the clinical reports of fifteen cases.

The diagnosis of neurasthenia was primarily made in all. The varied subjective symptoms, the long time over which these symptoms had been complained of, the absence of detectable organic lesions, the build and nervous construction of these individuals seemed to justify this conclusion.

The diagnosis of tuberculosis could not have been made in these cases on the usual symptoms and physical signs of this disease because these were absent.

These patients had no cough (with two or three exceptions), little or no fever, no night sweats, no hemophthisis, no rapid loss in weight, no sputum—hence no tubercle bacilli in sputum.

The presence of a tuberculous lesion in these cases was determined on, first, by a positive reaction to a subcutaneous injection of tuberculin. All the cases except one were injected and gave a positive reaction. In this case (Case 15) tubercle bacilli were subsequently found in the sputum. Second, a history of exposure to an open case of tuberculosis (nine of the fifteen gave this history). Third, doubtful lung signs not sufficient in themselves to establish the diagnosis but valuable as corroborative evidence (six of the fifteen cases gave these).

Roentgen-ray chest examinations were made in six of the cases; in four the roentgenologist reported positive findings in the lungs, in two negative. In one of the cases (Case 12) the roentgenologist reported a healed lesion. The patient, however, gave a positive reaction to tuberculin. In a second case (Case 11) the roentgenologist was in doubt ("diagnosis indeterminate: possible very early incipient tuberculosis"). Yet the patient reacted to tuberculin.

CLINICAL SYMPTOMS

The clinical symptoms of which the patients complained were varied and failed to conform to the symptomatology of any known organic disease. The non-conformity of the symptom complex is a characteristic feature of the cases. Hence the usual diagnosis of neurasthenia.

Named in the order of their frequency they are indigestion (10 cases), headache (9), constipation (7), loss in weight (7), cold hands and feet (6), men-

1. Stiller: Die Asthenische Konstitutionskrankheit.

tal depression (6), crying spells (5), physical tire (5), neckache (5), backache (5), general weakness (5), mental tire (5), worrying over trifles (4), eyeache (4), dysmenorrhea (4), insomnia (3), pains in the chest (2), voice tire (2), dizziness (2), tendency to take deep breaths (2), clearing of throat (2), palpitation of heart (1), shortness of breath (1), fainting spells (1), jerking of limbs (1). Only four had cough and in only one of these was there sputum coughed up.

A careful study of the symptoms complained of gives one no help in differentiating these cases from so-called neurasthenia. The symptom complex they present is the symptom complex described by all writers for so-called neurasthenia. It is the symptom complex diagnosed by all clinicians as neurasthenia. It is so-called neurasthenia.

DURATION OF SYMPTOMS

The symptoms in this group of cases were suffered from over a long period of time. The duration of complaints is measured in years rather than months or weeks.

Five were sickly from childhood. Three complained of symptoms five years or over; four from one to two years, while only three of the fifteen dated their complaints back less than one year.

These patients apparently possess a high resistance against the tubercle bacillus: a relative immunity given to them by tuberculous ancestors or by an infection contracted in childhood which the cell forces of the body have reduced to a quiescent state. If this were not so there would be more active recognizable tuberculosis and less so-called neurasthenia.

In many of them the tuberculous process never becomes very active; the bacilli are probably finally killed out and the individual in later life comes into a fair degree of health.

In some active symptoms and signs appear only after years of suffering from the slow fires of a low-grade tuberculous toxemia often interpreted as neurasthenia (Case 15).

PHYSICAL FINDINGS

The physical examination of these patients revealed little or no positive evidence of organic disease.

In none was a positive clinical diagnosis of tuberculosis made. A searching examination of the chest and other organs was negative for tuberculosis or other organic disease in nine of the fifteen cases.

In the remaining six, doubtful physical signs in the chest were present; but in none of these were the findings fixed and definite enough to establish a diagnosis of tuberculosis beyond a reasonable doubt, even after weeks of observation.

In the majority of these patients the tuberculous process will go unrecognized or diagnosed as (so-called) neurasthenia if the clinician relies on the knowledge furnished him by physical examination alone.

PHYSICAL BUILD

Eleven of the individuals in this group were tall and slender. They had prominent, angular features; high cheek bones; long chests; long, flat or scaphoid abdomens, and slender arms and legs. Two were short of stature but slender build. Two others were of short, chunky build with round faces, broad full chests and short rounded abdomens, and short extremities.

All were of high-strung nervous temperament. All those (seven) in which the position of the abdominal organs was determined showed enteroptosis. Thirteen of the fifteen cases therefore conform to the physical construction of the "habitus phthisicus."

Stiller expresses the relationship between "habitus phthisicus" and "habitus asthenicus" in these words: "There is no doubt to my mind that the habitus phthisicus and habitus enteroptoticus are not only strikingly similar to each other but also are completely identical." This study tends to confirm his conception.

TEMPERATURE

Ten of the group showed at times slight rises in temperature (99.2 to 99.4) usually in the afternoon with a subnormal morning temperature of (97 to 98.2). (Temperature records were taken with patients in bed.)

The afternoon rise would usually occur only occasionally, patients often going for days with no rise above normal. The subnormal morning temperature was more regular, most of the cases showing it day after day.

If these patients are up and about, however, they usually run a temperature of 99.2 to 100 under physical exertion or mental excitement.

These occasional temperature rises in persons with so-called neurasthenia are of great significance. They are often the only tangible clinical evidence of a concealed tuberculous lesion.

In this connection it is interesting to note that in Weir Mitchell's "Fat and Blood," every case reported by him (eight in all) in which systematic temperature records are given had fever (99.2 to 101.2).

PULSE-RATE

The pulse-rate in this group is characterized by its variability and its tendency to rise above the normal. The maximum was usually 100, the minimum about 70. In three cases the pulse-rate ran between 100 and 120. In two the minimum was as low as 60.

A variable pulse-rate is encountered in so many other organic conditions that its value from a diagnostic point of view is doubtful.

If, therefore, one were to draft a clinical picture of this condition with which we are dealing he would describe it as follows:

A person usually under 25 years of age with or often without a history of known exposure to tuberculosis comes complaining of a varied lot of symptoms expressing nervous and physical exhaustion, the most common of which are indigestion, headache, constipation, mental depression, cold hands and feet, backache, neckache, eyeache, crying spells, chilliness, loss of weight, etc. These symptoms have dated back over a number of years with periods of improvement followed by relapse under unusual nervous or physical strain. Partial or complete breakdown often results. On inspection one notes a poorly nourished, high-strung person with angular features, high cheek bones, long chest and abdomen, slender arms and legs and active reflexes.

A careful physical examination reveals no positive evidence of organic disease. Enteroptosis is usually present. Doubtful lung signs are occasionally encountered. The pulse-rate is usually increased; the tem-

2. Es ist mir unzweifelhaft dass der habitus phthisicus und enteroptoticus nicht nur einander auffallend ähnlich sondern ganz und gar identisch sind.

perature record shows an occasional afternoon rise to from 99.2 to 99.4 or more. The laboratory findings are negative for organic disease.

The clinician is puzzled; the long history, the build and nervous construction of the individual, the absence of the signs of organic disease leads to the diagnosis of neurasthenia (so-called). But what is this disease called neurasthenia? Will some one please answer?

Are these patients negative for organic disease? I have given the historical summaries of fifteen in which the evidence is positive that a tuberculous infection exists. It is an active tuberculous process because I do not believe that any one will be so foolish as to argue that a positive reaction to a subcutaneous injection of tuberculin means anything less than an active tuberculous process somewhere in the individual giving that reaction.

The location of the lesion whether it be in the lungs, lymph-glands, peritoneum, bones, or wherever it may be focused need not concern us at present.

The fact stands out that in many of these individuals whom we have been considering negative for organic disease the evidence is incontrovertible that an active tuberculous infection does exist. Are we justified in taking the view that these symptoms of (so-called) neurasthenia are a clinical expression of such an infection? I think we are.

First, because we have no evidence to prove that these individuals harbor any other organic disease except tuberculosis.

Second, because we have good evidence for believing that tuberculosis is a chronic disease often contracted in childhood and remaining in the body in a semiquiescent state for years. The long history of many of these cases can thus be accounted for.

Third, because tuberculosis is the one chronic disease which gives most typically the symptoms of nervous and physical exhaustion encountered in neurasthenia (so-called).

Fourth, because we know that the tubercle bacillus produces a toxin (tuberculin) which circulates in the blood and is capable of producing for years a low-grade toxemia with all its varied clinical expressions.

Every experienced clinician marvels at the varied symptomatology of his recognized cases of tuberculosis, to say nothing of the clinical manifestation of those not recognized.

Are the cases presented patients with neurasthenia harboring an associated tuberculous process? I think not. If some one will demonstrate a pathologic base for neurasthenia so that it can be identified and differentiated from other diseases of known pathology, discussion on this phase of the subject might be profitably continued. In the absence of such pathologic lesions and with reliable proof of the existence in these individuals of a tuberculous process and of this only, it is only reasonable to conclude that an infection is present which is common and about which we know a great deal rather than with a name given to a symptom complex about which we know nothing.

A further question immediately presents itself. What proportion of the cases diagnosed as neurasthenia in which a careful physical examination reveals no tuberculosis, no lues, no nephritis, no exophthalmic goiter, no gastric ulcer or any other recognizable organic disease, shows evidence of a concealed tuberculous infection? I have not as yet sufficient clinical data at hand to answer this question. In my experi-

ence, after excluding all other organic diseases, the number of persons exhibiting the symptoms of so-called neurasthenia failing to react to a maximum dose of a subcutaneous injection of tuberculin is small.

But is it not probable that if one were to select a given number of individuals and subject them to the subcutaneous tuberculin test as large a proportion would react as have reacted in this series of cases?

To this question I answer: No. In between 500 and 600 individuals with symptoms suggestive of a tuberculous infection whom I have injected with tuberculin for diagnostic purposes during the last twenty years, not more than 55 per cent. have given a positive reaction.

I have presented no distinctly pathologic proof that a tuberculous lesion exists in these individuals. This is impossible. These patients are living. They may not die for years. When they do die and are examined of what value is the evidence? If a tuberculous lesion were present at necropsy how could one know whether it existed at the time the individual complained of his symptoms. If a tuberculous lesion is present and healed how can one know whether it was healed at the time of the patient's illness. It is present and active how can one know whether the lesion was present and active at the time the patient complained of his nervous and physical exhaustion?

Post-mortem evidence has proved the reliability of the subcutaneous tuberculin test, and farther than this need not be called up in settling the question under consideration.

Nor can one rest his proof on the later development of recognizable tuberculous lesions. Some of these patients have already developed clinical evidence of the infection. Most of them have not and probably never will develop clinical tuberculosis as it is now understood.

The lesion is too minute, too well walled off, the bacilli are not virulent enough, or the resistance of the individual is too high.

It is for this very reason that so many of these cases are overlooked. It is for this very reason that the diagnosis of neurasthenia has so often been made.

Nor can the proof rest on the presence of tubercle bacilli in the sputum or other excreta. Most of these patients had no cough, hence no sputum and no tubercle bacilli in sputum.

A positive von Pirquet test was present in all but one case (Case 8). But a positive von Pirquet test can not be depended on to detect an active tuberculous infection. In this connection Case 8 is of interest. The von Pirquet test was negative while the subcutaneous test was positive. In my experience with between 500 and 600 injections of tuberculin for diagnostic purposes, I have met a number of cases in which the von Pirquet test was negative while the subcutaneous tuberculin test was positive. I shall make these cases a subject for a later study.

The stereoscopic Roentgen studies of the chest in the hands of an expert can be made of assistance in detecting some of these cases, but cannot be relied on in determining the broad question whether an active tuberculous process exists in these individuals.

The recognition of an active tuberculous infection in these cases must therefore rest primarily on a specific test (for this purpose I have used a subcutaneous injection of tuberculin), and secondarily on corroborative evidence such as a history of exposure to tuber-

NEURASTHENIA AND TUBERCULOSIS—HEAD

culosis, or the presence of suggestive clinical evidence in the lungs, lymph-glands or elsewhere in the body. I have here presented evidence, which it seems to me is conclusive to prove that:

1. Many individuals exhibiting the symptom syndrome of so-called neurasthenia harbor a tuberculous infection and this only.
2. The tuberculous process in most cases is so concealed as to escape detection by the usual clinical examination methods employed, and a specific test must be used to reveal its presence.
3. In the light of this evidence these cases should be diagnosed as tuberculosis and not neurasthenia.
4. We should recognize and adopt a new clinical symptom type for concealed tuberculosis.
5. This symptom type is the symptom complex now recognized by clinicians the world over as neurasthenia.

abandoned and the diagnosis made of tuberculosis (concealed), focus not determined, with chronic tuberculous toxemia exhibiting so-called neurasthenic symptoms.

CASE 2.—Mrs. J., aged 37, married, one child. Family history negative for tuberculosis. Personal history negative except a miscarriage one year ago. Patient has been a healthy woman until one year ago when, following her carriage, she began losing in strength and weight. Contracted la grippe about nine months ago which left her with a slight clearing of throat which continued for two months or more. This disappeared during the summer but reappeared again in the fall. No sputum coughed up. For the last three months has felt nervous and miserable; everything no matter how trifling seems like a mountain to her; she cries at the slightest provocation; is despondent and blue. The slightest exertion, mental or physical, tires her and she has had to give up all her social duties and home cares. Is bothered much with aching in the back of neck. Has had her eyes fitted repeatedly for glasses to relieve her headaches. Has cold hands and feet. Has lost 10 pounds in the last six months. Patient had been carefully examined by different physicians who told her she was nervous and should take a rest cure.

Patient is a short, stockily-built woman, with broad chest and short abdomen, dark hair and eyes. Mucous membranes rather pale. Well-nourished. Weeps during examination. Pupils react promptly to light and accommodation. Kneec jerks active. Marked tremor of eyelids with eyes closed. Active dermatographia. No exophthalmos. No von Graefe's sign. Some tremor of finger-tips. A searching physical examination was negative for organic diseases except that in the lower right chest anteriorly over the fourth and fifth interspaces a fine pleural friction-rub could be heard. Repeated examinations always disclosed the friction-rub in this area.

Urine and blood examinations negative. Wassermann reaction negative. Von Pirquet test positive. Not being able to make a positive diagnosis the patient was given 1/2 c.c. of Bureau tuberculin and gave a positive tuberculin reaction (temperature 100.4) within eighteen hours after injection was given. No Roentgen examination of chest made. The diagnosis of neurasthenia was then abandoned. The friction-rub in right chest and the positive tuberculin reaction justified the diagnosis of tuberculosis of right pleura; chronic tuberculous toxemia exhibiting symptoms of so-called neurasthenia.

CASE 3.—Mrs. L. W. B., aged 30, married, no children. Family history negative except one brother dead of tuberculosis. Personal history negative except childhood diseases. Well as a young woman, never had been sick. Married three years and has been occupied with her husband (a college professor) in teaching work.

About one year ago began running down in weight. At that time was spending many hours in the classroom and doing much outside church and social work. Became blue and depressed; cried easily and on slightest provocation. Was tired all the time and could not get enough sleep. Had an aching pain in back of neck, especially when tired. Had headaches. Lost her appetite. Chilled easily; hard to keep her hands and feet warm. Had a slight cough, especially when using her voice much. No sputum. Hoarsed up easily after talking. Had no fever, no night sweats. Became so nervous and worn out that she had to stop teaching. Consulted various physicians who told her she had neurasthenia and was overdoing.

Patient is a tall, well-developed woman, some pigmentation of skin over cheeks and face. Long chest and abdomen. Face round and full. Patient is much depressed and weeps during the taking of the history. Knee-jerks very active; active dermatographia; pupils react to light and accommodation. Some tenderness in neck and along spine and over abdominal aorta.

REPORT OF CASES

CASE 1.—Miss E. L., aged 23, single, living at home, admitted to the St. Barnabas Hospital, Oct. 14, 1913, complaining of backache, insomnia, spells of depression, indigestion. Family history negative. Present history includes a long series of ailments of various sorts, curvature of spine at 5 years of age, at first thought to be tuberculous, later considered hysterical; chorea at 10 years of age; dysmenorrhea at 15 years of age; various abdominal operations finally terminating in hysterectomy in February, 1912. No cause given by the operating surgeon for the hysterectomy other than that he considered it best for the patient's general state of health. No pathologic lesions found.

History of present complaints dates back over a number of years and includes a long series of symptoms, including indigestion, vomiting, abdominal pain, pain in back, insomnia, constipation, attacks of mental depression with hysteric manifestations, crying spells, dizziness, aching in the neck, headache, eyeache and physical tire on exertion. Has had a slight nervous cough for years. Has dieted to such an extent that she can scarcely eat solid food of any kind. Patient is a tall, angular-looking girl, high cheek bones, long chest and abdomen, marked tremor upper eyelids, increased knee-jerks, pupils react to light and accommodation, no incoordination, some tremor of finger-tips, no enlarged thyroid, no exophthalmos. Patient presents the stigmata of a highly nervous girl; hands, arms and legs were constantly twitching during examination; seems melancholy and depressed. Careful physical examination of this patient, including searching examination of the lungs, revealed no evidence of organic disease. There was gastroptosis, a dilated kidney on right side, tenderness over abdominal aorta and along lower spine. Urine and gastric examinations negative, no occult blood in stools. Blood examinations showed slight secondary anemia (hemoglobin 87 per cent.). Wassermann reaction negative. Von Pirquet test positive. Patient was carefully observed in hospital over a period of two weeks. She had an occasional rise in temperature to 99.2. Pulse 85 to 100. She presented all the earmarks of a highly neurotic young woman, with frequent crying spells, much mental depression, vomiting attacks, headache, and slight dry cough. No sputum. Had two fainting spells while going to the bath room. Roentgen examination of spinal column and lungs negative.

On the fifteenth day after admission, patient was given 1/20 c.c. of Bureau tuberculin, showing a positive reaction (temperature 102) within sixteen hours after the injection. Following the positive tuberculin reaction the clinical diagnosis of neurasthenia was

3. Bureau tuberculin is the tuberculin made by the U. S. Bureau of Animal Industry. It is a 10 per cent. solution of Koch's old tuberculin. It is the tuberculin used in testing cattle for tuberculosis.

A careful physical examination was negative for organic disease. There was gastropnoxis. Urine and blood examinations were negative. No sputum. Pulse 95. Temperature showed an occasional afternoon rise to 99.2. A searching physical examination of the lungs was negative, except roughened breath-sounds in left apex. No impairment of percussion note. No râles heard. Von Pirquet test positive. No evidence of lues.

While under observation patient seemed a nervous, much depressed woman, cried at times and complained of aching pains in the head, neck, back, chest and limbs. On the fifth day a subcutaneous injection of 2 mg. of Koch's old tuberculin was given with a marked positive reaction (temperature 102.8) within sixteen hours following injection. No Roentgen examination of chest was made.

The diagnosis of neurasthenia was not confirmed. The diagnosis was made of tuberculosis (focus concealed) with chronic tuberculous toxemia exhibiting symptoms of so-called neurasthenia.

CASE 4.—Mrs. W. V., aged 23, married, housewife, one child, referred to the University Hospital June 2, 1913, complaining of headache, dizziness, indigestion, backache, irregular and painful menstruation, and tenderness in the lower abdomen; symptoms dating back two and one-half years. Family history negative. Previous history negative, except whooping-cough as a child.

The patient was carefully studied for sixty-three days in the surgical service of the hospital and then referred to the medical service with the diagnosis of neurasthenia. After her transfer the patient was again examined. She was a tall, rather poorly nourished woman, high cheek bones, long chest and abdomen, color slightly anemic, active dermatographia.

A careful thorough examination including urine, blood and Roentgen-ray chest study revealed no evidence of organic disease. Wassermann reaction negative. Von Pirquet test positive. The patient exhibited the earmarks of a highly neurotic woman, and the provisional diagnosis of neurasthenia was concurred in. Pulse 60 to 90. Temperature normal with an occasional rise to 99.4 in the afternoon.

On the twenty-fourth day after admission to the medical service patient was given $\frac{1}{20}$ c.c. of Bureau tuberculin with a typical positive reaction within twelve hours following the injection (temperature rising to 101.6).

The diagnosis of neurasthenia was abandoned. The presence of a positive tuberculin reaction justified the diagnosis of concealed tuberculosis, focus not determined; chronic tuberculous toxemia exhibiting the symptoms of so-called neurasthenia.

CASE 5.—Miss I. P., aged 24, Scandinavian, single, white, housekeeper, admitted to the University Hospital Oct. 26, 1913, complaining of shortness of breath, headaches, precordial pain, lassitude and weakness on physical and mental exertion.

Family history negative. Personal history negative except usual childhood diseases. The patient was treated five years ago for neurasthenia and took a rest cure in a hospital. Her present complaints date back three months and includes a history of mental and physical tire, some loss in weight, headaches, especially when she reads, poor appetite and indigestion.

Patient is a tall, fairly well-nourished girl, high cheek bones, long chest and abdomen, fair color, pupils react to light and accommodation, knee-jerks active.

A thorough clinical investigation of this case, including pelvic and rectal examinations, also urine, blood and gastric studies, was negative for organic disease. No sputum. Wassermann reaction negative. Von Pirquet test positive. Temperature normal with an occasional rise to 99.2. Pulse 70 to 96. Clinical diagnosis based on the history of physical and nervous exhaustion with negative physical findings was neurasthenia with astigmatism (Macnie).

On the thirty-first day after admission patient was given subcutaneously $\frac{1}{60}$ c.c. of Bureau tuberculin with a typical positive reaction (temperature rising to 101.4) within twenty hours after injection of tuberculin. The diagnosis of neurasthenia was then abandoned.

The history and the positive tuberculin reaction in the absence of evidence of other organic disease justified the diagnosis of concealed tuberculosis, focus not determined; chronic tuberculous toxemia exhibiting symptoms of so-called neurasthenia.

CASE 6.—Miss H. W., aged 21; single, white, stenographer, admitted to the University Hospital, Jan. 28, 1913, complaining of pains in abdomen, indigestion, dysmenorrhea and nervousness.

Family history negative except that mother died after five months' illness of probable tuberculosis of lungs. One sister now has chronic cough. Patient has never been strong, long history of backaches, menstrual troubles and recurring winter colds. In July, 1911, had a nervous breakdown followed by a period of weakness and prostration. Finally became so weak and run down that she had to stop work.

Present complaint dates back over two years and consists of a long history of ill-defined pains in upper and lower abdomen and left chest, associated with indigestion, eructations of gas, nausea, loss in weight, cold hands and feet, painful menstruation, prostration and weakness.

Patient is a fairly well-nourished young woman, seems weak and talks in a low voice; long chest and abdomen; color good; pupils react to light and accommodation; knee-jerks active; palpable postcervical lymph-glands.

A careful thorough physical examination of this patient, including repeated examination of the lungs, revealed no positive evidence of organic disease.

The apex of the right lung was questionable; there was marked visceroptosis; blood and urine negative; there was no sputum; von Pirquet test was positive; Wassermann test not made. Temperature normal. Pulse 70 to 100. No positive diagnosis could be made. The patient was high-strung and nervous and this fact together with the negative clinical findings led to the diagnosis of neurasthenia.

On the thirteenth day after admission patient was given $\frac{1}{20}$ c.c. of Bureau tuberculin subcutaneously with a typical positive reaction (temperature 100.4) within sixteen hours.

Roentgen examination of chest twelve days later showed "diffuse infiltration of both lung fields, especially marked in the right" (Bissell).

The diagnosis of neurasthenia was therefore abandoned and the diagnosis made of pulmonary tuberculosis with chronic tuberculous toxemia exhibiting symptoms of so-called neurasthenia.

CASE 7.—Miss M. L., aged 32, single, stenographer. Father died of tuberculosis of the lungs, four sisters and one brother dead of tuberculosis of the lungs. Never strong as a girl, subject to colds and bronchitis. Three years ago was in California for bronchitis one winter during which she gained 12 pounds in weight. Gives a long history of ups and downs with weakness, poor indigestion, exhaustion from physical effort, aching in the back and loss in weight.

Comes now for pains in her right chest and precordial region which she has had for about a week. Has had pains also in the left chest for a month or more. Pains are a dull ache, and chest is sore to pressure. Occasionally patient feels pains in axillae, left scapula and back. Deep breathing or cough does not aggravate them.

For about two years patient has had a clearing of her throat, more marked in the morning. Has lost 10 pounds in weight during the past year. Appetite is poor. Is bothered much with sleeplessness. Has pains at her menstruation, and now feels so weak and nervous that she has had to stop work.

Has been examined by many physicians and lung specialists, all of whom had suspected her of being tuberculous, but none of whom had been able to find evidence of tuberculosis in the lungs or elsewhere in the body and had, therefore, diagnosed her case as neurasthenia.

Patient is a fairly well-nourished girl, looks high-strung and neurotic, color pale, light hair and eyes, high cheek bones, long chest and abdomen, pupils react to light and accommodation, tremor of finger-tips, knee-jerks active.

A careful physical examination of this patient revealed no evidence of organic disease. A searching physical exami-

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nation of the lungs was negative for tuberculosis. Patient had a moderate grade of gastropotosis. Sputum and urine examinations negative. Von Pirquet test positive. Blood-pressure 116. Pulse 90 to 100. Temperature normal.

Not being willing to accept the diagnosis of neurasthenia, and not being able to make the diagnosis of tuberculosis, the patient was subjected to an injection of $\frac{1}{2}$ c.c. of Bureau tuberculin, and gave a positive reaction (temperature of 102) within eight hours after injection was given.

The clinical diagnosis of tuberculosis (concealed) with chronic tuberculous toxemia exhibiting symptoms of so-called neurasthenia was then made.

CASE 8.—Miss L., aged 25, Jewess, single, stenographer. Family history negative except that mother died of tuberculosis when patient was a child at home.

Personal history negative except walking typhoid fever (?) five years ago. Operated on twice for pelvic displacements. Present history dates back six years and includes a long history of nervous symptoms, including headaches, backache, neckache, insomnia, cold hands and feet, indigestion, cough, exhaustion, rest cures, operations, treatment by osteopaths and Christian Scientists, etc. Insomnia and indigestion have been her most troublesome symptoms. Has been seen and examined by many physicians and the diagnosis of neurasthenia usually made. Has taken a number of rest cures from which she would temporarily improve and go back to work only to relapse into a weak, prostrated state, rendering her unfit for her occupation. Has lost 40 pounds in weight in the last six years.

Patient is an ambitious, intelligent, bright young woman, dark hair and eyes, high cheek bones, long chest and abdomen, slender limbs, pupils react promptly to light and accommodation, knee-jerks active, pulsating abdominal aorta, active dermatographia. Marked tremor of eyelids with eyes closed. No exophthalmos, no von Graefe's sign, no enlargement of thyroid.

A careful physical examination of this patient revealed no evidence of organic disease. There was marked gastropotosis and bilateral nephropotosis. Blood, urine and stomach examinations negative for organic disease. No Wassermann test made. Exploratory abdominal section negative for organic diseases in stomach, gall-bladder, appendix or elsewhere. Searching examination of lungs revealed no evidence of tuberculosis. Von Pirquet test negative. Temperature showed an occasional rise to 99. Pulse 80 to 100. The clinical diagnosis of neurasthenia seemed justified.

After patient had been under observation for six weeks and despite the negative von Pirquet, the patient was given $\frac{1}{2}$ c.c. of Bureau tuberculin with a typical positive reaction (temperature 101) within twenty-four hours following the injection.

The clinical diagnosis of neurasthenia was then abandoned and the diagnosis made of tuberculosis (focus concealed) with a chronic tuberculous toxemia exhibiting symptoms of so-called neurasthenia.

CASE 9.—Miss S. (referred by her physician as a case of neurasthenia and admitted to Asbury Methodist Hospital, Dec. 1, 1909), aged 23, living at home, family history negative except that two sisters have died of tuberculosis of the lungs. Has never been a strong girl. Has always been very nervous and of late on account of a mental worry has been bothered with a constant desire to take deep breaths. This deep breathing occurs during the day while she is awake; is not aware of it at night (is present while she is asleep). At times has a slight cough which has always been considered a nervous cough. No sputum coughed up. Has not lost in weight. Occasionally has slight fever (99.2). No sweats, no chills. For the last week has complained of feelings of distress in the upper abdomen. Patient is a fairly well-nourished girl, sensible and intelligent, seems high-strung and fidgety, good color, long chest and abdomen, pupils react to light, knee-jerks very active, tremor of eyelids. During the examination patient keeps taking long deep breaths in rapid succession, one after the other. The deep breathing is worse when she sits up than when lying down.

A careful physical examination of this case including a searching examination of the lungs reveals no evidence of organic disease. Blood, urine and gastric contents normal. Von Pirquet test positive. The abdominal aorta was pulsating and tender and there was ill-defined tenderness over the upper abdomen, but no mass. Patient was repeatedly examined but no conclusion could be arrived at.

On the seventh day after admission patient was given $\frac{1}{2}$ c.c. of Bureau tuberculin and gave a typical positive reaction with a temperature rise to 101.5 within fourteen hours following the injection. No Roentgen examination of the chest was made.

The diagnosis of neurasthenia was therefore not confirmed, but the diagnosis of concealed tuberculosis with chronic tuberculous toxemia producing neurasthenic symptoms was made. The focus could not be located.

CASE 10.—W. K., aged 29, male, single, American, carpenter, referred to the University Hospital, Feb. 16, 1912, as a case of nervous dyspepsia and neurasthenia. Family history negative. No tuberculosis. Denies venereal disease. Has had mumps and small-pox.

Dec. 7, 1911, patient began complaining of palpitation of the heart. Consulted a physician who examined his heart and pronounced it all right. The attacks continued for a number of days until his stomach was washed out, since which time the palpitation has not bothered him. Patient has not felt well since the attacks in December. Is bothered with belching of gas after meals, constipation, headaches, especially at night, has felt weak and nervous, has frequent urination, and at times ringing in his ears. Patient has no cough. He has lost about 17 pounds in weight since sickness came on.

Patient is a thin, spare man, fairly well-nourished, color good, answers questions promptly and to the point, is nervous and apprehensive about himself. Pupils equal, react to light and accommodation, knee-jerks active, slight cyanosis of lips and finger-tips, cervical glands just palpable.

A careful physical examination of this patient revealed no evidence of organic disease, except a questionable area on the upper right chest anteriorly below clavicle. Here the percussion note is slightly impaired, expiration somewhat prolonged and a few fine cracking râles could at times be heard at the close of inspiration close to the right sternal border in first interspace. Blood examination showed a secondary anemia of mild grade. Urine and sputum negative. Von Pirquet test positive. Gastric analysis negative except an increased acidity. Pulse 60 to 80. Temperature 97 to 98.4.

On the tenth day after admission patient was given $\frac{1}{2}$ c.c. of Bureau tuberculin with a positive typical reaction (temperature 102.0) within sixteen hours following the injection. Roentgen examination of chest March 1: "There is a rather marked thickening about the hilus of the right lung. A number of peribronchial lymph-nodes in both lungs. The right apex is distinctly more dense than the left." Roentgen diagnosis: Incipient tuberculosis (Bissell).

The diagnosis of neurasthenia could not be confirmed. The suspicious physical signs in the chest, the positive tuberculin reaction, the Roentgen chest findings justified the diagnosis of tuberculosis of the right lung with chronic tuberculous toxemia exhibiting symptoms of so-called neurasthenia.⁴

Donaldson Building.

ABSTRACT OF DISCUSSION

DR. NATHAN ROSEWATER, Cleveland: Dr. Head is right in distinguishing these cases of disguised starvation from neurasthenias. I believe a much larger class which have "that tired feeling" in the morning after sound sleep are obviously not neurasthenias, since the neurasthenic class after a night of rest with sleep wake up refreshed from the rest of nerves, brain and body, and only as they tire out sooner or later do they fag. Another class described in the paper which I read before this Section in 1908 as cases of "disguised starvation" should also be excluded.

These are cases of more or less undernourishment resulting in more or less bankruptcy of brain, muscles, organs or tissues with impoverishment of circulatory fluids, which condition is perhaps the greatest cause of non-resistance to tuberculosis or other germ invasion, because neither the blood-stream nor the exhausted cells are in any condition to offer the necessary 100 per cent. or more of resistance to the invading germs from without, nor are they able to prevent the breaking down of foci already present. A class akin, is of those who wake refreshed but complain of wearing out before or soon after noon, unable to keep brain and body at work. On questioning these we find that they have taken for breakfast a cup of coffee, with or without a little bread. This insignificant meal cannot prevent the human machine from breaking down, any more than an automobile can be kept going when one starts away with a pint of gasoline instead of five gallons. These patients when advised to eat three or four eggs for breakfast come back reporting that they are veritable indefatigable steam-engines. Tuberculin may give a positive reaction in nearly all cases in adults but that does not prove active tuberculosis. A woman patient suffered from insomnia, but was otherwise well. Roentgenograms were made and she was told she had pulmonary tuberculosis, basing it on the Roentgen-ray findings and rapid pulse. She had neither fever, cough, râles nor other symptoms. She was examined by three able men than myself and no active tuberculosis found. This was nearly five years ago and she is still in excellent health. As to the enteroptoses, they may be primary or secondary, mostly the latter. I have seen many with nephroptosis, gastroptosis, etc., some with Stiller's habitus and quite a number without. These ptoses are due to asthenias, occurring before or after the development of the habitus, and caused primarily by a large variety of undermining, exhausting influences, metabolic, toxic, infectious, psychic, or by overstrain or underfeeding, and not until the primary causes and the ptoses are overcome will these secondary asthenias respond to treatment.

DR. F. M. POTTENGER, Los Angeles: Dr. Head has illustrated the important fact that neurasthenia has a tuberculous toxemia as an underlying cause in a large percentage of cases. Tuberculosis affects all of the systems of the body, and, strange to say, even the symptoms of the early pulmonary form of the disease calls the attention away from the lungs rather than to them, the larynx, the heart, the stomach and the nervous system seemingly being affected. This neurasthenia is better understood when we recall that tuberculosis begins in childhood; that nearly every individual is affected; that the lesion heals in some at once, but in many passes through stages of quiescence and activity, extending now and then from the primary focus of infection to other parts of the body, so that necropsies in adults show more than 50 per cent. in and about the apices of the lungs. From such lesions as fail to heal, toxins are given off which have a profound effect on the nervous system, producing neurasthenia. Many young people who fail to develop properly, who have lowered resistance and manifest an unstable nervous system belong to this group. Such patients often respond remarkably well to the measures used in the treatment of tuberculosis and are definitely benefited by tuberculin treatment. Many believe that the phthisical habitus is often a result of tuberculosis instead of a cause. Unless the medical profession can get away from their conception that tuberculosis is the disease which we usually term consumption, and will recognize the early infection and the slight symptoms which are produced months, sometimes years before the active advanced stage manifests itself, it will miss completely the point of the modern teaching concerning this disease.

DR. CHARLES STOVER, Amsterdam, N. Y.: Myasthenia gravis should be differentiated before determining that the patient is suffering from neurasthenia. It is not uncommon, particularly among those who are interested in diseases of the nervous system, to meet both the neurasthenic and tubercu-

lous type of cases which, in course of time, come under the classification of myasthenia gravis.

DR. ELIZA MOSHER, Brooklyn: I have been much interested in the statement that nearly all of the patients included in Dr. Head's report had enteroptosis. According to Sir Arbuthnot Lane of London, intestinal stasis due to enteroptosis is one of the underlying causes of a large number of special diseases, tuberculosis among the number, and I believe he is right. We are finding behind many cases of neurasthenia, melancholia and even epilepsy, the systemic poisoning produced by the products of chronic intestinal stasis, and as we become skilled in the diagnosis of gastro-intestinal displacements, "bands" and "kinks," we shall more and more often find one or all of these conditions present in the abdomen of patients suffering in these and other ways. I also understood Dr. Head to say that in the cases he reported the long slender trunk so common among young tuberculous patients was a common feature. I have yet to find a delicately built girl of this type, especially if she has broad hips, who does not manifest a strong tendency to enteroptosis. Dr. Head's cases should arouse us all to the importance of making a careful examination of the abdomen in all of our patients and especially in slender-bodied undernourished, neurasthenic girls and women.

DR. A. J. CAFFREY, Milwaukee, Wis.: We all know that a very large number of neurasthenics pass through the free dispensaries, and I have charge of the medical department of the free clinics in the Marquette University at Milwaukee and have been making routine tuberculin tests of the patients we class as having neurasthenia. In nearly all cases, perhaps 90 per cent., there is a positive reaction to subcutaneous injections of tuberculin and also to the von Pirquet test. I think, from these observations, that there must be some direct connection between neurasthenia and concealed tuberculosis.

DR. JOHN RITTER, Chicago: I have observed that in at least 40 per cent. of the so-called neurasthenic patients, tuberculosis in some form is present. It, like walking typhoid, belongs to that large category of diseases in which more than 50 per cent. of patients are tuberculous. We see it in cases of hypo-acidity, of which at least 30 per cent. point to tuberculosis. All these, like tuberculosis following trauma, are manifestations of a previous existence of tuberculosis, the symptom-complex only following in the train of a previous disease. Tuberculosis is, as Dr. Pottenger points out, like syphilis and follows a similar course. The full picture of pulmonary tuberculosis is only the last or tertiary stage of the disease following long after the primary infection. I cannot too strongly emphasize that, in the use of tuberculin for diagnostic purposes, the intracutaneous mode of application should be used and not the subcutaneous. In the public schools in Vienna every child, at entrance, is given a von Pirquet test for diagnostic purposes. To all who do not react to this test a second one is given intracutaneously, and it has been observed that about 80 per cent. of those children who do not react primarily to the von Pirquet react positively to the Mantoux test. With regard to the cases of healed lesions, the application of tuberculin for testing purposes is of no value because from the very nature of the disease we know that these cases all react positively.

DR. TOM A. WILLIAMS, Washington, D. C.: I cannot agree with Dr. Head's statement that all neurasthenia is due to latent tuberculosis. While I am one of the few neurologists who believe that neurasthenia, unlike psychasthenia and hysteria (which are psychogenetic), is a purely physical disorder and, moreover, due to some cause or other extraneous to the nervous system, rather than to hypothetical "nerve fatigue," I cannot accept latent tuberculosis as the sole source. We must remember that symptoms quite similar to those described by Dr. Head, are not uncommon, as every southern physician knows, in the early stages of pellagra, in hookworm disease and in latent malaria. Besides dys-thyroidea as well as other glandular irregularities is responsible for disorders often labeled neurasthenic. In connection with Dr. Head's thesis, however, it is interesting to

recall the investigation made in the neurologic clinic of the New York Postgraduate Hospital some years ago by Dr. Haskell, who found many of the neurasthenics suffering from a tuberculosis which had been overlooked by other physicians. Many of us regard enteroptosis not as the cause but as the effect of asthenic states, to which also the intestinal disorders may be secondary; furthermore, it must be remembered that many cases of enteroptosis develop neither neurasthenia nor tuberculosis. With these qualifications, Dr. Head's paper should be of the greatest value in warning practitioners against permitting themselves to make a diagnosis of neurasthenia.

DR. WALTER B. SWIFT, Boston: I agree with Dr. Williams that not all patients with neurasthenia have tuberculosis. A young woman in the neurologic service of the Boston City Hospital presented all the typical signs of neurasthenia. Six or eight months after that diagnosis was made she died of carcinoma of the stomach. Neurasthenia is not a useless word. It makes a good waste-basket—something to say in place of "I don't know." We would do better to dispense with not the word but the waste-basket and instead give these patients further exhaustive physical and mental investigation.

DR. ALBERT ROBIN, Wilmington, Del.: Neurasthenia is a word rather loosely used to the great disadvantage of the suffering public. This term "neurasthenia" is now used as the term "malaria" was formerly used. The more we practice medicine the better diagnoses are made and we do not have to fall back on these terms of doubtful significance. In connection with my work at the tuberculosis clinic for the past ten years fully 20 per cent. of those applying for treatment have no other physical examination made except a casual one through the patient's clothing. I believe that neurasthenia is intimately associated with the early stages of tuberculosis, and because few men are able to make a diagnosis of incipient tuberculosis it is necessary to formulate some scheme by which a diagnosis in the early stages of tuberculosis may be arrived at. The busy doctor has not the time to make a thorough examination in these cases; in fact he hardly has the time to read his medical journals, and thus familiarize himself with latest methods. It should be remembered, in making a differential diagnosis between neurasthenia and tuberculosis, that in the former disease there is no elevation of temperature. In every case of tuberculosis or tuberculous toxemia, in these cases of concealed tuberculosis at one time or another there is a slight elevation of temperature. This temperature curve appears particularly after exercise. The question of exercise in making a diagnosis of concealed tuberculosis is one of great importance, and if patients are kept under observation for any length of time the diagnosis can be readily made. I am referring to slight exercises. I generally instruct the patient to walk to my office every evening, for a week, and I take his temperature immediately on arrival. A slight elevation of temperature will appear which will not appear at other times. I am in favor of an educational campaign among physicians that will cause them to be more careful in examining their patients in order to detect concealed tuberculosis or the disease in its earlier stages. I want particularly to emphasize the importance of detecting this elevation of temperature following exercise, which is as diagnostic as the reaction following injections of tuberculin, and far safer. The symptom-complex of neurasthenia plus slight elevation of temperature on exertion, plus rapid pulse, means tuberculosis.

DR. J. P. MUNROE, Charlotte, N. C.: In a paper which was read at the state society of North Carolina it was stated that the tubercle bacilli found in animals in the mountains were acid-stained and in every animal examined they were practically identical with the tubercle bacilli found in the human body. Also the symptoms appearing in these tuberculous animals were like those that appeared in the human being.

DR. ROBERT N. WILLSON, Philadelphia: It would seem as though one were taking a rather radical step in endeavoring to include in the term "tuberculosis" all or even a large

percentage of the cases of neurasthenia or nerve-tire. No one questions that the tuberculous toxin may and does predispose to neurasthenia in certain cases. Just as certainly there are many patients with neurasthenia who show no evidence during life of tuberculous infection, either before or after their cure. Most cured neurasthenics enter on their convalescence without any treatment directed toward or suitable to tuberculosis. Again, many cases of neurasthenia have a definite etiology that can be traced altogether distinct from tuberculosis, such as cardiac disease, intestinal toxemia, nervous overwork or worry, syphilis, oftentimes the very lack of a definite object in life and the consequent irritation and fretting of unsympathetic home surroundings. Neurologists speak of various types, sexual, cerebral, cerebrospinal, gastric and circulatory. Often these terms are more closely related to the etiology than to the symptomatology. Not one of the pictures is necessarily tuberculous. Of course any one may be, in a given instance. An important etiologic phase of the subject has been altogether neglected in the discussion, which would have been touched on at once had there been a thoroughgoing neurologist present. No one has mentioned the fact that practically every case of neurasthenia develops from neurotic and often from positively neurasthenic soil. We seldom fail to find the parentage of a neurasthenic tainted on one side or the other with nervous invalidism. Alcoholism, epilepsy, insanity, hysteria and neurasthenia are the progenitors of neurasthenia in the second generation. Tuberculosis may or may not be present as a concomitant, and perhaps as an exciting factor. When the soil is tainted, however, tuberculosis is not needed as a factor in the causation of the neurasthenia, which will develop in the child of the neurotic parent when the conditions are right.

DR. GEORGE DOUGLAS HEAD, Minneapolis: My contention is not that all cases of so-called neurasthenia harbor a latent tuberculosis, but that in the group of cases clinically diagnosed as neurasthenia, after excluding syphilis, heart-disease, exophthalmic goiter, gastric ulcer, nephritis and all other known organic diseases, a certain number remain in which no organic lesion can be found. This "remnant group" has been considered negative for organic disease, and because of the existence of these cases the clinical entity neurasthenia has been kept alive. Now when the individuals in this group supposed to be free of organic disease are tested with tuberculin, a large percentage of them show evidence of harboring an active tuberculous lesion, so concealed, however, as to escape detection by the usual clinical examination even of the most searching kind. I contend that the symptoms of nervous and physical exhaustion displayed by these patients and now diagnosed as so-called neurasthenia is in reality a clinical expression of a concealed tuberculous lesion and that we should recognize a new clinical symptom-type for concealed tuberculosis which is the symptom-type we now give to neurasthenia. The question has been asked, What percentage of the cases in this "remnant group" of so-called neurasthenias give evidence of harboring concealed tuberculous lesions? I am not prepared to answer this question at this time because my series of observed cases is not large enough to give reliable data. Roughly speaking, I should say that about 20 per cent. of the "remnant group" fail to give a reaction to a subcutaneous injection of tuberculin.

The Thyroid Problem.—How the tissues are affected by the secretion of the thyroid is an enigma. But the fact is certain. For the adrenal cortex even so much as that cannot be said. There is only the conjecture that this fatty substance is essential to a man's strength and manhood. . . . To the Australian or "black fellow doctors" the fat above the kidney was magic. If by incantations it could be removed from an enemy as he slept, the victim would surely lose his strength and die. We know as much, that there is no warm-blooded life without these glands.—T. R. Elliott, *Brit. Med. Jour.*, June 27, 1914.

INTRARECTAL ADMINISTRATION OF SODIUM SALICYLATE IN ACUTE RHEUMATIC FEVER WITH SATISFACTORY RESULTS*

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CINCINNATI

In 1912, I published a report¹ covering 22 cases in which the intrarectal administration of sodium salicylate in acute rheumatic fever was apparently successful. The present report is based on 100 additional cases in hospital and private practice, the results of which indicate the advantage of this method over the usual modes of treatment in acute rheumatic fever and I would urge the adoption of the method at the hands of this representative body.

The intrarectal method of salicylate administration was adopted in 1911 on the East Medical Service in the Cincinnati General Hospital after observing the number of refractory cases of acute and subacute rheumatism in the wards. Previous to this, text-books had mentioned the possibility of such a method of treatment, while very meager reports had appeared in the literature (notably, however, Erlanger's in 1893 from the Klinik Von Ziemsens), but no attempt had been made to urge the general adoption of this measure as the method of choice. Erlanger² reported twenty-five cases with seventy-eight salicylate enemas and his report showed very satisfactory results with as small a dosage as from 6 to 8 gm. daily, and also gave satisfactory proof of the ready absorbability of the drug by the rectum.

But the value of the intrarectal sodium salicylate administration has not met any general recognition. Many other drugs have been given per rectum, most often for their local effect, as quassia, silver preparations, tannic acid, while certain others, as opium, digitalis, collargol, quinin and various serums have been used for their remote effects, but most of these latter if not to be administered by mouth may be used preferably by the subcutaneous method, a method not to be so readily adopted for salicylate medication, though Seibert reports satisfactory results. Heretofore we have permitted ourselves to be satisfied with the administration of sodium salicylate by mouth and the results have without doubt justified the designation of the drug as a specific in acute rheumatic fever.

The salicylic acid group of substances is bactericidal and according to Meyer and Gottlieb, salicylic acid is probably etiotropic, that is, acting on the cause of the disease. If the recent investigations of Pointon and Paine and Rosenow are to be regarded as conclusive, we must look to a bactericidal agent for rational therapy and in the absence of a specific serum or vaccine, sodium salicylate and certain newer salicylic acid preparations as, salol, aspirin, salipyrin remain our principal weapons in acute rheumatic fevers.

But why should there be so many failures with salicylic acid therapy, which is in every way to be regarded as a specific? No doubt in many instances there are foci of reinfection, in which surgical meas-

ures may be necessary. But in very many instances there has been insufficient dosage due most often perhaps to the frequent intolerance of the drug by mouth; and following on this failure the drug manufacturers have not been slow to introduce preparations more readily tolerated, but without doubt less efficient than sodium salicylate in the therapy of acute rheumatic fever. There is still much indifference among medical men toward pharmacology and therapeutics, perhaps inherited from the days of therapeutic nihilism, and if we fail in a therapy learned possibly in student days, many are apt to seek at once the new therapeutics as taught by the detail men.

If a routine administration of sodium salicylate has not always given brilliant results as it often does, however, the drug should not have yielded its position so largely to the newer salicylic acid preparations. As a solution to the problem of rheumatic therapy, intrarectal administration of sodium salicylates is offered as the method of choice and as excellent a therapist as the late Dr. Frederick Forchheimer declared it to be the best method yet devised for the treatment of acute rheumatic fever.

The method has for its justification its ability to answer the requirements of any therapeutic agent: (1) the ease of administration; (2) the ready absorption of the drug; (3) a minimum of untoward effects; (4) the ability to administer large quantities of the preparation as is to be advocated in bactericidal therapy; (5) the removal of the residue of the drug from the bowel by subsequent enema, if the dosage ever proves excessive; (6) the results are more prompt than by any other measure.

EASE OF ADMINISTRATION

I have used intrarectal salicylate therapy in 125 cases of joint affections, the majority of which occurred in hospital practice, where, to be sure, the method is most easily carried out. The method, however, lends itself readily to private practice as well. Recently in a severe protracted case of rheumatic fever occurring in a rural district, I advised the removal of the patient to a hospital in Cincinnati, in order to carry out the rectal therapy. The wife of the patient thought that she might be able to carry out the treatment at home and she did so and was promptly successful. I received a similar report from a physician in South Dakota recently and there is reason to believe that the method has been widely used since my report two years ago.

The method of administration is as follows: A cleansing soapsuds enema is given and as soon as effective is followed by the salicylate enema given by means of a Davidson syringe and a rectal tube inserted 6 to 8 inches. The dose varies according to the size and sex of the patient and also according to the severity of the case. The first adult dose in men is usually from 8 to 10 gm., in women 6 gm., women being apparently more susceptible to salicylism than men. The synthetic salicylate has been used, especially since the clinical research carried out by the Council on Pharmacy and Chemistry, in which I had the privilege of assisting, the results of which proved the practical similarity in action of the synthetic and natural salicylates. The amount of salicylate to be given is incorporated in 120 to 180 c.c. of plain or starch water with the addition of 1 to 1.5 gm. of opium tincture. The dose of salicylate may be repeated in twelve hours, when it can usually be determined whether symptoms of salicylism will appear. Usually, however, a daily

* Read before the Section on Practice of Medicine at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Heyn, Louis G.: Acute Articular Rheumatism Treated by the Rectal Administration of Sodium Salicylate, *THE JOURNAL A. M. A.*, April 6, 1912, p. 1013.

2. Erlanger: *Deutsch. Arch. f. klin. Med.*, 1893, li-iii.

enema suffices with doses increasing perhaps from 30 to 50 per cent. daily until the limit of tolerance is reached. The largest daily dose which has been given has been 24 gm., and the only symptoms of salicylism which usually have appeared have been tinnitus and excessive perspiration. Once or twice there has been vomiting present, which might occur in the administration of even a simple enema. Where salicylism has been excessive, it usually appears within from three to six hours and the remaining unabsorbed portion of salicylate may be washed out of the bowel by subsequently indeed, and it is rare also that the rectum is intolerant of the drug. I do not agree with Erlanger that the plain water enema is more readily retained than the starch water, although the former is more simple, which is in its favor. It might be said at this point also that salicylate medication must continue some days after all symptoms have subsided, otherwise recurrences are frequent.

READY ABSORPTION

In testing out the value of this method it was interesting to note the promptness of absorption by the rectal mucous membrane. Usually within fifteen minutes, always within thirty minutes, a strong ferric chlorid reaction appeared in the urine and the reaction usually persisted for from forty-eight to seventy-two hours after the administration of the drug ceased. To show also that complete absorption was usually possible, the stool subsequent to the salicylate enema was examined by acidifying with hydrochloric acid, extraction with ether and testing with ferric chlorid. As a rule usually within from twenty-four to thirty-six hours, depending on the size of the dose, there was complete absorption as shown by a negative reaction. (It would seem that the greatest absorption is within twelve hours.)

PROMPTNESS OF ACTION

Results show promptness of action. If we consider acute rheumatic fever as a disease which runs a most variable course, with a migrating involvement of usually many joints, each affected joint remaining at an acute stage of inflammation for several days, the attack possibly running a severe course of one or two months, often in spite of a more or less vigorous treatment (or there may be a less severe course involving fewer joints or perhaps only a subacute recurrent course of the disease) it may be readily seen that a satisfactory judgment of a therapeutic measure in this disease may be very difficult. A satisfactory therapeutic agent in acute rheumatic fever, however, should accomplish the following results: promptly lessen and eventually abolish all symptoms of the disease, materially shorten the course of the disease, reduce cardiac complications to a minimum and possibly prevent recurrences.

The following illustrative cases in which the intrarectal administration of sodium salicylate has been resorted to may be convincing.

CASE 1.—Man, aged 32. Attack began ten days previous to admission to the Cincinnati Hospital, with successive involvement of the right hip and right knee, left knee and ankle and left shoulder. On admission the joints most acutely affected were the left elbow, left shoulder, left wrist and several phalangeal joints of both hands. The temperature reached 102 F. the first day. A salicylate enema of 10 gm. was given and a similar enema twelve hours later with complete cessation of symptoms and prompt drop of the tem-

perature to normal. Three subsequent enemas of 10 gm. each were administered on three successive days with no recurrence or cardiac complications, the patient insisting on leaving the hospital four days after admission.

CASE 2.—Man, aged 34. On admission to the Cincinnati Hospital patient had a temperature of 103 F. and involvement of both knees and both ankles acutely. Ten gm. of sodium salicylate were given daily per rectum. The second day of residence in the hospital the temperature reached 102.4 F. and only the right knee remained acutely inflamed. The third day the temperature had reached normal and there were no joint symptoms remaining. The patient insisted on leaving the house on the fourth day.

CASE 3.—Colored woman, aged 27. Patient had involvement of both ankles and wrists and a temperature ranging from 101 to 102 during three days' residence in the hospital, during which time sodium salicylate (20 grains) was administered by mouth every three hours during the day. Symptoms were uninfluenced by medication per os. After a single salicylate enema of 10 gm. the temperature dropped to normal and remained there and there was a complete subsidence of symptoms. The enemas were continued for four days subsequently.

CASE 4.—Man, aged 39. Admitted July 16, 1912, with a temperature of 101.6 F., pulse 108. There was involvement of both knees and ankles and both shoulders and wrists. Sodium salicylate enemas of 10 gm. were given daily. Three days later there was a maximum temperature of 100 with maximum pulse 104 and all joints except wrists were improved. The fourth day 13.3 gm. of sodium salicylate were given with complete cessation of symptoms, but with some salicylism and the enemas were discontinued. On the fourth day after discontinuance of the enemas, however, there was some recurrence of joint symptoms and 13.3 gm. were administered for four successive days in spite of some tinnitus and excessive perspiration. The temperature became normal and the joint symptoms subsided completely within ten days, during which time a total of 100 gm. of sodium salicylate had been administered. This case was somewhat refractory on account of the salicylism, but we were able to carry the treatment carefully to a successful issue.

These cases are fairly illustrative of the efficacy of the intrarectal salicylate therapy and if the more common methods of treatment in acute rheumatic fever have so often been disappointing, the intrarectal method is offered as a very safe and reliable solution to the therapy of this serious affection.

22 West Seventh Street.

ABSTRACT OF DISCUSSION

DR. E. W. MITCHELL, Cincinnati: I wish to corroborate the report made by my associate concerning the value of the rectal method of administering the salicylate. To obtain the specific action of the drug, the primary doses should be large. It is often quite difficult to give sufficiently large doses by the mouth. We have seldom found difficulty in giving by rectum from 75 to 150 grains, twice daily. That the drug is promptly absorbed is shown by its early appearance in the urine, as Dr. Heyn stated, and also by the relief of pain, reduction of temperature, etc. Notwithstanding these evidences of absorption, we have found almost constantly that the ringing in the ears, nausea and other unpleasant effects are much less marked than when given by the mouth. Why this should be so I do not know, unless the local irritation of the stomach is responsible for many of the unpleasant effects of the salicylate. We believe that salicylic acid is a specific, but that it must be given in large doses in the early stage of the disease. It has been objected that while salicylic acid itself is a germicide, its salts are very feebly so, and however given salicylic acid always circulates in the blood as a salicylate. Dr. Wood has recently offered an ingenious explanation in answer to this objection. His theory is that the excess of carbonic acid in the congested areas converts the salicylates into salicylic acid, enabling it to exert its germi-

cidal or antiseptic power. I have also found the rectal method successful in private practice, whenever a competent nurse was in charge.

DR. JOSEPH L. MILLER, Chicago: Dr. Heyn shows that salicylates when administered by rectum are actually absorbed, but it is difficult to understand why salicylates by rectum in a certain dose should have a greater action than the same amount by way of the mouth, as, after all, it is apparently a question of the amount of the drug absorbed and we know that salicylates are readily absorbed by the gastro-intestinal tract. I believe one explanation of the excellent results Dr. Heyn obtained was the fact that the doses he employed were relatively large, larger in fact than the ordinary dose administered by mouth, and if the absorption was complete by the rectum it would have the same effect as if the equivalent amount were given by mouth. His work shows that in those cases in which the drug is not tolerated by mouth, it can be well taken by way of the rectum. I differ somewhat from Dr. Heyn, that salicylates are a specific in rheumatism, as statistics show that patients treated by salicylates remain in the hospital quite as long as those receiving other forms of treatment for their arthritis.

DR. J. N. UPSHUR, Richmond, Va.: In the discussion of this subject a few years ago in this Section, a number of speakers stated that their practice was to give large doses of salicylates, often as much as 300 grains in twenty-four hours, that endocarditis was a troublesome sequel, and they were at a loss to explain why. I said then practically what I repeat now. In the treatment of rheumatism, a good dose of a mercurial should be given at the start. The pronounced acidity of the sweat and urine is a conspicuous symptom, indicating the administration of alkalis until these excretions are neutral. My practice is to give, well diluted in water, potassium bicarbonate, 10 grains every two hours for forty-eight hours, following it with small doses (5 grains) of sodium salicylate every two hours for about two days. Relief is usually prompt. I never give more than a dram of salicylate in twenty-four hours, and rarely that much. I believe that large doses of salicylates predispose to the development of endocarditis, and the patient is much more liable to relapse, than if a foundation is laid by the exhibition of the mercurial, followed by the alkali. I desire to enter my protest against these excessive doses of the salicylates as being most harmful and dangerous.

DR. J. M. RECTOR, Columbus, Ohio: I have used this method successfully by a more satisfactory and thorough method. The solution is introduced into the colon with a large rectal tube to the point of toleration; the irrigator is then disconnected from the rectal tube and the solution forced into the upper parts of the colon by introducing air behind the solution with the aid of the Politzer bulb; the Politzer bulb is then removed and the solution which was not carried out of the sigmoid permitted to flow out of the tube. More solution is then introduced and the Politzer bulb again used until the entire colon is moderately distended. This traps the solution and carries it higher with a more equal distribution along the tract, increasing the surface through which the drug may be absorbed. This procedure is painless and I have been able to get better results with smaller doses in greater dilution, and this method also assists in elimination and drainage of the entire alimentary canal and leaves the upper part of the tract undisturbed so that it may follow its normal digestive activities uninterrupted. The three advantages are: 1. It increases the resistance of the patient by not disturbing the digestive ability in the upper part of the alimentary canal. 2. It increases the elimination and relieves all tendency to absorption from a constipated colon. 3. It gives the direct introduction of salicylate of soda in large doses with all its beneficial effects and without the digestive disturbances which usually follow the use of this drug by mouth.

DR. JAMES TYSON, Philadelphia: In 1896 my attention was called to the efficiency of this mode of administration of the salicylates advised with a view to getting rid of the unpleasant gastric symptoms so often associated with the use of salicylates by mouth. Of late years, however, it has

been found possible to refine the salicylates so as to get their effects without the disagreeable nausea. Aspirin, for instance, is a result of such refinement, does not disturb the stomach nearly so much and is equally efficient, rendering administrations by the rectum less essential.

DR. NATHAN ROSEWATER, Cleveland: When salicylates first began to be used in the New York Hospital, in 1878, I saw enormous doses given with remarkably good results compared to the older methods. Germ life, metabolic and other causes have been studied since then. Knowing that salicylic acid is a powerful inhibitor of fermentation, 1 grain being sufficient to preserve a pint of fruit-juice or other saccharine fluid, it occurred to me years ago that in proportion to the body-fluid such doses were entirely out of proportion, and the unnecessary and perhaps harmful effects far in excess of that required to inhibit germ life. I began at first to give 10 grains in chronic lithemic cases, before meals, when the stomach was practically empty—at least then the salicylate would not inhibit the action of the proteolytic and carbohydrate enzymes—and in acute cases and later in all cases to give only 15 to 20 grains at bedtime, three or more hours after supper. During the day I depended first on alkaline laxatives, such as citrates and tartrates to empty the gastro-intestinal canal, and on sodium iodid and other haloid salts to reduce the viscosity of the blood-stream and to relieve the heart of overtension, sparing it and aiming to avoid damage to this readily damaged organ. By elevating the lower extremities and even the upper ones, using gravitation to assist the venous return and sparing the cardiac mechanism, my results have been most satisfactory. For instance, in a very stout woman, aged 67, with all the joints of the lower extremities red, swollen, and very painful, temperature 102 F. and the digital extremities also swollen, I succeeded in having her on her feet in twelve days, without relapse. I have not given atophan, although my colleagues have been instructed to use it whenever salicylates should fail. The same is true of other preparations which I have kept on hand but have had no use for, although I use and have prescribed annually for many years, with this small dosage, approximately 100 pounds of sodium salicylate, not the natural, but the ordinary synthetic quality. I am glad to see that Hanzlik at Lakeside Hospital has corroborated the fact that the so-called natural salicylic acid has no advantages over the U. S. P. synthetic product. I have never seen ill effects except rarely when the stomach was not empty, the hydrochloric acid still present, liberating sufficient salicylic acid to irritate the gastric mucosa into distress or even to cause vomiting.

DR. W. W. TOMPKINS, Charleston, W. Va.: Our duty in this class of cases does not consist in how few days our patients are in the hospital, or confined in their homes, but our chief object should be that, when our patients get out, they should be free from endocarditis and its unpleasant symptoms. The question each physician should ask himself is how efficient is the patient after an attack of acute rheumatism? The method and dose of administration of a medicine is but secondary. Few of us have such large experience as Dr. Miller when he treats 2,000 cases by one method and 1,600 by another. Each of us has an experience, it may be relatively small; but what is important is the percentage of actual recoveries. When cases respond so readily to remedies as reported by Dr. Heyn may it not be that we would in such cases take a too optimistic view and not safeguard our patients for a few days or weeks by rest and freedom from work or exercise? Is it a safe practice to permit a patient four or five days after his initial symptoms to leave his bed or the hospital and go about or resume his vocation? If the joints of the lower limbs are involved we get a forced rest because it is painful and impractical to get about, but if a wrist or elbow is involved our patients can go about and will do so if we do not restrain them or admonish them as to their danger. The reduction of fever and the allaying of pain should be aimed at, but the important point to keep in mind is the specter of a diseased heart with all its unpleasant sequels. Dr. Heyn mentions treating 124 cases by this method—quite a large number. Will

VACCINES IN PERTUSSIS—HESS

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THE USE OF A SERIES OF VACCINES IN THE PROPHYLAXIS AND TREAT- MENT OF AN EPIDEMIC OF PERTUSSIS*

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Last December pertussis broke out in the main building of the Hebrew Infant Asylum, an institution which houses about 375 children, ranging in age from a few days to 6 years. It soon became evident that the disease was destined to assume considerable proportions, and that we were on the threshold of an epidemic. An occurrence of this nature offered an exceptional opportunity to make an extended test of the value of vaccination in this disease.

The study of an epidemic within the confines of an institution has marked advantages over the study of an equal number of cases selected from hospital or private practice. In the first place, it must be evident that the fact that an epidemic originates from a single source, that the cases are due, in all probability, to infection with the same type of micro-organism, greatly simplifies the solution of the problem; it negatives the question of whether a difference in the severity of symptoms is due to a variation in virulence of the invading bacteria. In hospital or in private practice, on the other hand, the cases must always have originated from manifold sources. It is probably also of advantage, from the standpoint of comparison, that these institutional children belong to the same stratum of society, that they have for the most part been reared for a considerable period within the same walls, having the same daily routine, including similar food and an equal amount of outdoor life. These are some of the conditions which are insisted on in considering the course of experimental infection among laboratory animals, but which can rarely be controlled in a study of infection in man.

Many of the hospital studies of the treatment of pertussis are, however, open to the severer criticism, that owing to the poorly defined onset of this disease there is no means of knowing how long the children were ill in their homes. This fact is naturally of great importance in considering the success of treatment. All these objections can likewise be raised in regard to cases treated in the dispensary or in ambulatory practice; in addition, this type of case is open to the criticism that one must rely solely on the opinion of ignorant parents in judging the efficacy of the treatment.

PROPHYLACTIC USE OF VACCINE

We shall first consider pertussis vaccine in its prophylactic use. Here a field of exceptional promise presented itself. Two hundred and forty-four patients were inoculated with four different vaccines. Vaccine 1 consisted of a typical strain of the Bordet-Gengou bacillus obtained from Parke, Davis & Co., and two atypical strains. Vaccine 2 was "Bacterin" (Parke, Davis & Co.), which is stated to be composed of a pure culture of the bacillus of pertussis. Vaccine 3 was prepared from four typical cultures of the Bordet-Gengou bacillus isolated by Dr. Anna Williams of this laboratory. Vaccine 5 may be termed an autog-

* From the Research Laboratory, Department of Health, New York City.
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he please state how much lower his percentage of endocarditis is than we have by the method of administering the salicylates by the mouth. It is to the hospital clinician that we look for our statistics in these matters.

Dr. Louis G. Heyn, Cincinnati: I desired to state in the paper the results, in general, of the therapy and to cite a few instances fairly illustrative of the response of a class of cases to a definite line of therapy. The proof of the methods suggested must rest on the observations of those who are quite impartial in their judgment of results obtained. Dr. Miller's discussion was enlightening to me. It may be that what he said is a strong argument against the bactericidal effect of the salicylates, for he injected various bacteria and then gave the salicylates with apparently no effect on the bacteria, which would tend to prove that the salicylates have no bactericidal effect. Salicylates have apparently never had any effect where there is evidence of a general bacteremia as would be indicated by an endocarditis, and animal experimentation and clinical results are not always in accordance. The more I see of cases of acute rheumatic fever and the promptness with which this affection reacts to the salicylates the more I am inclined to believe that the drug must have some direct effect on the bacteria in this affection. I am quite in accord with the alkaline therapy with its frequently good results; it is also well known that many patients recover without any therapy, but there are few diseases causing such severe suffering as acute rheumatism, and most of us will at least seek the analgesic action of the salicylates. I must again answer the contention for the drug by mouth. Large doses by the mouth are possible and effectual in many cases, say from 20 to 30 grains five times a day, but this amount cannot be continued many days. The attack may be subdued within ten or twelve days; but not always, as Dr. Rosewater contends. On the other hand, one sees many cases prolonged weeks or months even in spite of the salicylate treatment. Someone has said that the salicylates predispose to cardiac affections. I have given it even in cases of marked cardiac arrhythmia and have seen no untoward effects, so far as I could judge. Dr. Rector's suggestion that this method of administering the enema be modified by the use of the Politzer bag, instead of the Davidson syringe in our method, would seem feasible. As to Dr. Tyson's statement that there is no further need of the use of sodium salicylate since the introduction of the newer preparation, notably aspirin, I am not prepared to endorse his views, although this may be so. I am surprised to learn that Dr. Tyson had used intrarectal salicylate so many years ago, and had I known it I should have incorporated the fact in this paper. Relative to the number of cases of endocarditis following this method of treatment, I have seen only one case in which endocarditis developed during the attack. Occasionally an apparently cured patient with rheumatic fever has been discharged from the hospital and at the next observation some time later, we have found a valvular lesion. It is difficult to determine whether it is subsequent to the previous rheumatic attack or due to a mild infection in the interval between the rheumatism and the appearance of the valvular lesion.

The Production of Senna in the Sudan.—The senna exported from Egypt is gathered from shrubs growing wild in the Sudan and the Red Sea littoral of Arabia. The Sudan variety is the *Cassia acutifolia*, which furnishes what is known as *Cassia angustifolia*, which supplies the senna called Mecca, Arabian or Indian. Senna is gathered once a year, in October, the size and quality of the crop depending on the abundance of the rainfall. The leaves and fruit are allowed to dry on the branches. The product is classified in four grades as follows: whole leaves, half leaves, broken bits and fruit (bean). Suez is the collecting point for both Sudan and Mecca senna. Arabian statistics are not available, but during the year 1912 senna from the Sudan was exported to the value of nearly £10,000 (\$50,000) and in the first half of 1913 to over £6,000 (\$30,000).—*Jour. Roy. Soc. Arts*, June 10, 1914.

enous vaccine in the sense that it was composed of three typical Bordet-Gengou strains isolated from cases included in this epidemic. Table 1 shows the results of the vaccinations. It may be summarized by the statement that *twenty of the 244 cases developed pertussis in spite of the prophylactic inoculations.*

TABLE 1.—PROPHYLACTIC VACCINATIONS (244 CASES)

Vaccine	No. of Inoculations	No. Treated	Pertussis
1	2	35	10
2	3	10	1
3	3	141	6
5	3	58	3
		244	20

Let us examine this table somewhat more closely. It will be seen that Vaccine 1 shows by far the greatest number of failures. Two injections of the vaccine were given in each instance, one of 100 millions, the other of 200 million bacteria. Of the ten cases which developed pertussis, five showed the first symptoms two or three weeks after the first inoculation, one after twenty-five days, one after six weeks, two after an interval of two months or more. In considering the results of prophylactic inoculations, all cases were discarded and not included in the tabulation (Table 2) which shows the development of symptoms of pertussis within two weeks of inoculation.

TABLE 2.—DETAILS OF THE TWENTY CASES DEVELOPING PERTUSSIS NOTWITHSTANDING PROPHYLACTIC VACCINATION

Name	Date Vaccinated	Type of Vaccine	Date of Onset of Pertussis	Severity of Disease
D. F.	1/12	1	3/ 5	+++
A. A.	1/12	1	1/30	+++
L. W.	1/12	1	1/26	++
B. A.	1/12	1	1/26	+
*A. S.	1/13	1	3/14	+++
N. K.	1/13	1	1/29	++
M. G.	1/13	1	3/14	+
I. W.	1/ 8	1	2/ 2	+
L. R.	1/13	1	1/29	+++
D. D.	1/13	1	4/ 1	++
A. H.	2/20	3	3/10	++
B. B.	4/17	3	5/ 6	+++
Y. G.	4/17	3	5/20	++
G. H.	3/24	3	5/ 8	++
R. T.	4/17	3	5/13	++
*A. S.	2/23	3	3/14	+++
J. S.	3/24	3	6/ 1	++
H. A.	4/14	5	5/24	+
J. B.	4/14	5	5/ 5	++
L. C.	4/14	5	5/12	+

* Received two varieties of vaccine.

When we turn to Vaccine 2 we find rather too small a number of cases to allow of a satisfactory estimate of its worth. Inoculations of 100, 200, and 400 millions were made at three-day intervals. The one case which developed pertussis showed symptoms two and one-half weeks after the first inoculation. It should be mentioned in this connection that five of the cases of this group developed ring-worm and were therefore sent away from the institution. As a result, the period of exposure to infection by pertussis was shortened in these cases.

The results obtained with Vaccine 3 are particularly interesting, as they are so much better than those obtained with the other vaccines. The same doses were given as of Vaccine 2, and with the same intervals. In twenty-four of this group of 141 cases, large doses were given by mistake, namely, 500, 1,000, 2,000 millions. One of these children nevertheless developed pertussis. This case (A. S., Table 2) is of especial interest in that the child received two prophylactic doses of Vaccine 1 about the middle of January, and three very large doses of Vaccine 3 towards the end of February, and notwithstanding this treatment came down with pertussis on March 14; the disease was

exceptionally severe, whooping being continued for a period of ten weeks. The other cases, five in all, developed pertussis three weeks, six weeks, one month, and one about two months following inoculation.

As the result of prophylactic vaccination with these three vaccines it was determined to make a vaccine from cultures obtained from cases in our wards. Dr. Anna Williams was kind enough to prepare a vaccine of this nature as well as to make cultures from the throats of many of the children. It should be emphasized that the typical Bordet-Gengou organisms could be isolated in only five cases out of the thirty cultures taken. In most instances other hemophilic bacilli, frequently the influenza bacillus, were isolated. It may therefore be maintained with some justice that in our cases the symptoms may not in all instances have been incited by the Bordet-Gengou bacillus, and that this accounts for the failures in the use of Vaccine 5. It will be noted that of the 58 cases inoculated with this vaccine three developed pertussis. All these children received 100, 200, and 400 million bacteria. Two of the number began to whoop about one month after vaccination, and one three weeks following the initial injection.

One hundred and thirty children did not receive prophylactic inoculations. This group included a ward of twenty-five infants under the age of 1 year, and another ward of about thirty infants between the ages of 12 and 18 months. These children must be considered separately, as they were at all times in bed, so that the danger of contact infection naturally was far less than in the case of runabout children. Moreover, in the one ward comprising thirty infants, no case of pertussis developed, so that they were not subjected to infection and therefore should not be included among those exposed to pertussis. Only one case of pertussis occurred among the twenty-five infants under 1 year of age. That this case did not lead to further infection shows the difficulties in judging of the results of prophylactic treatment. However, the fact that these infants did not come into close contact, that they were at all times in bed, should of itself exclude them from consideration. It would be a palpable error to compare infection in an infants' ward with that occurring in a ward of older children. This distinction should always be borne in mind in considering the degree of infection in institutions for children. If therefore we subtract these fifty-five cases—the thirty where no infection occurred and where consequently no exposure existed, and the twenty-five where exposure was greatly limited by absolute confinement to bed—we have eighty children who were not vaccinated. Of these eighty, fifty-nine developed pertussis. It will be remembered that of the 244 vaccinated cases, twenty came down with pertussis. There were five cases which cannot be included in the group of either the vaccinated or of the unvaccinated, as they began to whoop within a fortnight of vaccination; the case in the infants' ward constitutes a sixth case which cannot be considered.

It is difficult to determine the degree of exposure of the various children. No doubt it is true that at the very beginning of the epidemic, isolation was less complete and exposure to infection accordingly greater. This period, the early days of the epidemic, corresponds to the time preceding our employment of vaccine. However, granting a certain increased exposure of the unvaccinated at this period, we feel that the disparity in the ratio between the infected and the

non-infected is so marked among those vaccinated and those unvaccinated—among the former twenty out of 244, or one in twelve, among the latter fifty-nine out of eighty, or almost three out of four—that vaccination must have played a rôle. It should be mentioned in this connection that with the exception of the infants' ward, pertussis occurred in every ward in the building, and that quarantine regulations were enforced in the cases of children with suspicious cough or actually manifesting symptoms of the disease.

TABLE 3.—DISTRIBUTION OF EPIDEMIC ACCORDING TO WARDS AND MONTHS

Ward	Dec.	Jan.	Feb.	March	April	May	June	Total
I	..	..	..	..	1	..	..	1
II	..	..	..	..	..	..	..	0
III	..	2	3	3	2	..	..	10
IV	1	11	4	3	2	1	..	25
V	1	2	6	3	..	1	..	13
VI	..	..	..	1	..	..	..	1
VII	..	..	..	..	3	2	..	5
VIII	..	..	..	..	1	..	1	2
X	1	2	..	1	..	..	..	4
XI	1	3	1	5	..	..	..	10
XII	..	2	2	1	1	..	..	8
XIII	..	2	1	2	1	..	..	6
Total	4	29	17	19	10	5	1	85

* First case.

Table 3 shows the development of the cases both according to wards and according to months. It will be noted that in April the number of cases began to diminish. This time corresponds to the period of vaccination. In brief, vaccination was undertaken as follows: The 35 cases were inoculated with Vaccine 1 about the middle of January, and the ten cases with Vaccine 2 about the middle of February. At the very end of March and the beginning of April the large group of 135 cases were treated with Vaccine 3. In other words, prophylactic treatment on a large scale did not exist until the middle or end of April. This date corresponds with the beginning of the cessation of the epidemic. The epidemic may have been waning of its own accord; however, at this time, there was no abatement of pertussis throughout the city. We are therefore of the opinion that the vaccine was of value in preventing infection and in limiting this epidemic, but that it cannot be relied on in each individual case as a prophylactic measure. It would seem probable that there is considerable difference in the potency of various vaccines, and, following the deductions to be drawn from our results, that a polyvalent vaccine of typical Bordet-Gengou bacilli is most efficacious.

ACTIVE TREATMENT

Vaccines were also used in this epidemic in the active treatment of pertussis. As in prophylaxis, four vaccines were employed; however, one of these (No. 2) was not the "Bacterin" mentioned above but the "combined vaccine" of Parke, Davis & Co., which is composed of the Bordet-Gengou bacillus, influenza bacillus, various hemophilic bacilli, streptococci, etc. Of the eighty-five cases of pertussis constituting the epidemic, sixty-five were treated by means of vaccines, and twenty were not vaccinated. No other treatment whatsoever was given to either group of patients. About an equal number of children were treated with each of the four varieties of vaccine; the cases were not selected, a change in the type of the vaccine being instituted whenever about fifteen children had been vaccinated. In some cases two vaccines were made use of just as with the prophylactic treatment.

Table 4 seems of especial interest in judging of the efficacy of the vaccine treatment. This table, it will

be noted, is composed of the twenty severest cases of the epidemic. In compiling this list, we had recourse to the ward charts which showed the number of paroxysms of coughing and attacks of vomiting which each child had by day and by night, and were guided also by the opinion of the resident physician and of the head nurses. After the twenty cases had been selected in this way, a table was constructed to demonstrate their relationship to vaccination. It will be seen that of the total number only two received no vaccine treatment whatsoever. Five received both prophylactic inoculations and active treatment during the course of the disease; five were inoculated with two varieties of vaccine. This list, which is essentially a list of therapeutic failures, contains representatives of all four vaccines, but it will be noted that, as in the case of prophylactic vaccination, Vaccine 1 makes the poorest showing. It would seem that this table requires little comment. It clearly demonstrates that the use of vaccines in this epidemic did not lessen the severity of the disease. We should add that pertussis in New York City as well as in our institution was characterized this year by its mildness. Indeed, we did not experience any fatality and but two cases of pneumonia. In an epidemic of this nature it would evidently be less valuable to judge the results of treatment by considering the number of mild cases, than by noting those of exceptional severity. This is all the more pertinent in a disease having the irregular symptomatology of pertussis, where mild cases can be differentiated with difficulty from the common cough of non-specific origin. In the tabulated cases it cannot be contended that treatment was not begun sufficiently early, as the first vaccination was in almost every instance administered during the first week of the disease. This is as early as we can hope to be able to employ vaccines in the course of any disease. Moreover, a glance at Table 2 (composed of cases which developed pertussis notwithstanding prophylactic inoculation) shows that where these early inoculations failed to ward off the disease, its severity was not mitigated; that in numerous instances not only did the vaccine fail to prevent infection, but that it did not shorten or mollify the course of the illness. In no instance, however, did any harmful local or systemic reaction follow the injection of vaccine. In this connection we may add that all attempts to employ the vaccines for diagnostic purposes proved futile, whether as a cutaneous, intracutaneous or subcutaneous test.

TABLE 4.—VACCINATION IN RELATION TO THE TWENTY SEVEREST CASES

Case	Vaccine Prophylactic	Vaccine Curative	Case	Vaccine Prophylactic	Vaccine Curative
1	0	0	11	0	1
2	0	2	12	1	1
3	0	1 and 2	13	0	5
4	0	1 and 2	14	0	5
5	1	1 and 2	15	0	3
6	0	1 and 2	16	0	3
7	0	1	17	1	3
8	0	2	18	1 and 3	0
9	0	0	19	0	1
10	0	1	20	3	0

The complement-fixation test of the serum was carried out on ten cases, using the Bordet-Gengou bacillus as antigen. These tests were made by Miss Olmstead of this laboratory, whom I wish to thank in this connection. The number of cases is far too few to allow of a statement of the value of this reaction in pertussis. In general, however, the results would seem to show that this reaction is present for some

months after the cessation of all symptoms. Its chief interest is in connection with the still mooted question of the specificity of the Bordet-Gengou bacillus. It is for this reason that the cases are appended in a table (Table 5).

TABLE 5.—COMPLEMENT FIXATION TESTS

Name	Date of Onset	Type of Vaccine	Date Vaccinated	Severity of Disease	Fixation Test, June	Bordet-Gengou Bacillus
F. G....	3/ 4/14	3	3/10/14	+++	+++	+
G. S....	3/22/14	3	3/10/14	+++	+++	+
E. S....	2/ 4/14	2	2/25/14	+++	±	+
D. F....	3/ 5/14	1 and 3	1/12/14 3/20/14	+++	±	+
A. V*...	5/15/14	3	2/ 5/14	+	+	—
G. H....	5/ 8/14	3	3/24/14	++	++	—
P. B....	4/20/14	5	4/14/14	++	+	—
L. F*...	5/15/14	5	4/14/14	+	+	—
H. B....	4/22/14	3	4/17/14	+++	+++	—
C. C....	3/ 9/14	3	3/ 9/14	+++	+++	—

* Pertussis doubtful.

CONCLUSIONS

We have reported on the use of a series of vaccines in an epidemic of pertussis occurring in an institution for young children. An occasion of this nature furnishes exceptional opportunity to observe this disease, which is characterized by an indefinite onset and an irregular course, and is furthermore rarely adaptive to hospital study.

What deductions are to be drawn from the observations which we have recorded? It would seem clear that none of the four vaccines, including an autogenous strain, was of value in curing or tempering the disease in the epidemic which existed in our institution. That this failure was not due to tardy inoculations is emphasized by the circumstance that many of the severest cases received not only early active treatment but also prophylactic vaccination. No other conclusion seems possible from a review of the epidemic of 85 cases, and a comparison of the severity of the disease among the vaccinated and the unvaccinated. This opinion is based solely on our experience in this epidemic and does not preclude the possibility that a different dosage of vaccine, or treatment with a modified vaccine, may not prove to possess curative properties.

The use of the vaccines in prophylaxis seemed by analogy to offer greater promise, in view of the established fact that other vaccines, for example the typhoid vaccine, possess prophylactic although no curative power. This seems to some extent, although to a far less degree, to be true of pertussis vaccine. In view of the fact that twenty children developed pertussis in spite of the prophylactic treatment, we cannot compare its protective value to that of typhoid vaccine. However, the proportion of unvaccinated children who developed pertussis so greatly exceeded the number of the vaccinated who developed the disease, that we conclude that the vaccine has protective value in a certain percentage of cases, and that it should be employed in institutions and in families to prevent the spread of this infection.

16 West Eighty-Sixth Street.

ABSTRACT OF DISCUSSION

DR. JOHN ZAHORSKY, St. Louis: About two years ago I reported a series of forty cases of pertussis treated by vaccine in private practice. Dr. Hess has spoken of the Infants' Asylum children as being ideal for treatment. There is one objection to that; infants in asylums have much less immunizing power in themselves. They do not resist infection so well as children in families. Their response is much slower, and I do not think we can get as good results as in private practice. I am glad to hear that the effect of the prophylactic

injection was so marked. I was still in doubt as to whether we could expect a prophylactic injection to prevent whooping-cough. Bordet has shown how very difficult it is to immunize against this infection. There are some children who do become immunized to their own infection rather quickly. Others have great difficulty in becoming immune. There is a certain group of cases, those in children who have good health in every way, children who rapidly respond to infection, in which vaccines are of curative value. I think I have clearly shown that in about half the number of cases, if one, two or three injections are given at the height of the disease, thereafter the disease becomes much milder; not necessarily shorter, because after all it takes time to become immune to the pertussis bacillus. I used the vaccine last winter in fifty cases. Again and again we get such nice results from its use that it should be added to our stock of therapeutic aids in whooping-cough.

DR. T. C. McCLEAVE, Berkeley, Cal.: I have had a limited experience in the use of pertussis vaccine; yet it has taught me clearly that Dr. Hess is right. I have not been able to persuade myself that the vaccine was of the slightest curative value. Some of the mothers have thought so, but I was not able to corroborate their opinion. In a little epidemic at home I have had opportunity to use it in a number of families. I have vaccinated all of the children, the sick ones for curative and the well ones for prophylactic purposes. It was my experience that all of these children who were prophylactically treated and yet remained in association with the children with whooping-cough, failed to take the disease. That is, the prophylactic treatments were 100 per cent. effective, in only six or eight cases, it is true. I think the method is of value, and should unquestionably be used. This treatment is interesting to me as a private practitioner, and I believe it would be peculiarly valuable when I have particularly good control of my patients, because in the case of children continuously under my observation I intend to revaccinate from time to time and hope to prevent them having whooping-cough during their childhood. I hope to be able to determine the duration of immunity from pertussis vaccine by a method similar to the von Pirquet method for tuberculosis and the Gay skin-test for typhoid. Possibly next year I will have some information. I merely mention it as of interest. We may be able in children under our control at least to greatly reduce the susceptibility.

DR. S. M. HAMIL, Philadelphia: I have not used vaccines in the treatment of whooping-cough. A few years ago I made a complete study of the literature of pertussis, and I discovered at least 100 specific drugs recommended for the treatment of this disease. Quite interesting was the fact that some of these remedies were advocated by men of undoubted standing. Series of cases were reported in which the results were directly attributed to these various drugs. I remember, for instance, that Moncorvo reported glowing results in a series of cases from the direct application of aristol. Later he reported on it unfavorably. Where are those specific remedies now? Entirely forgotten. Why were they recommended by able men? Merely because it is so hard to determine the results of treatment in pertussis. An untreated case of great severity may suddenly develop sufficient immunity to change the entire nature of the case, even to the extent of producing a so-called abortive attack. The effect of drugs in such a case can only be misinterpreted. Therefore, we should interpret the results of vaccine treatment very cautiously. We should remember also that its application is painful, that vaccines are expensive and not free from danger. I have known of a number of instances in which alarming symptoms have followed their use. There is just as much evidence against the value of vaccines as there is in their favor.

DR. D. L. RICHARDSON, Providence, R. I.: This subject is very important, particularly from the point of public health. Will Dr. Hess explain whether in the class of cases in which he used vaccines they were infants or small children that were in bed? Were they put to bed in the attempt to control the disease, and in the non-immunized class were they older chil-

dren in which the question of personal contact was greater? That would bear materially on his results. Perhaps I did not clearly understand. If this vaccine does immunize, it will be of great value in the future in controlling the disease. The development is so insidious that the damage is done much as in measles, but in a more subtle manner.

Dr. KATE C. MEADE, Middletown, Conn.: We have just had two epidemics—one of whooping-cough and one of small-pox. We had a severe epidemic among the children of the well-to-do. Having heard of the results of this treatment from a friend in St. Louis, I asked Dr. Fisher to make me some autogenous vaccine for pertussis. The first vaccine made I think was weak. I tried it on twelve children. In many families the mothers were intelligent and able to interpret conditions. In each case it has been the oldest child who has brought the disease into the family—the child who has been in school. That child I never gave vaccine to, but immediately began on the small children. In one case I began with 150,000. I gave the vaccine in one case every day for three days, in another case each day for two days. In one case in which I knew a baby was coming into a home, and I thought it would be rather difficult to give a new baby vaccine, I gave a little boy six doses altogether, and no other medicine. In every one of these cases the disease was stopped within eight or ten days. A little cough was left, but no whooping and no vomiting or spasmodic attacks. The older children continued to cough, but did not reinfect the smaller children. The new baby came and did not take the whooping-cough. We have been using Dr. Fisher's vaccines a great deal—mostly autogenous. I think she has great skill in preparing them. In several children we used a combination of our vaccine and a stock coryza vaccine. My twelfth case was a man, aged 76, who had typical pertussis and pneumonia. I was interested, when visiting the New York laboratory, to find they are having difficulty in separating some of their strains from that of pneumonia. In the case of this man, I gave him an autogenous strain of his own pneumococcus. He recovered remarkably, both from the pneumonia and the pertussis.

Dr. EDWARD S. REIMER, New York: Will Dr. Hess say at what stage in these various cases treatment was instituted? In my own limited experience, by starting in early we get better control of the cases, and much better results.

Dr. FRANK W. PINNEO, Newark, N. J.: Dr. Meade's case in a man of 76, reminds me of an old lady who contracted whooping-cough last summer from a little child. While I ardently believe in vaccines, I did not use any in her case. Perhaps it was wise, because she contracted pneumonia and became very ill, but finally made a perfect recovery. We need greater knowledge about vaccines before laying down rules for their therapeutic use, and in institutions such opportunities as Dr. Hess has embraced are offered, while for private practice we may await further knowledge.

Dr. HENRY HEIMAN, New York: It is extremely difficult to differentiate between true pertussis and those cases of bronchopneumonia of influenzal origin with a distinct pseudopertussis cough. In these latter cases it is extremely difficult for little children to expectorate this sticky material from the smaller bronchi. We have to be very careful in making a differential diagnosis.

Dr. HARRY LOWENBURG, Philadelphia: I think Dr. Hess has not entirely proved his case. It is a remarkable thing that prophylactic cases should be so good and results with treatment should be so poor, especially in cases in which tremendous doses are given. It does not seem likely that a remedy that would prevent would not also cure. Will Dr. Hess state just what the amount of contact was in these cases that did not develop? That these children did not develop a cough was no proof that the vaccine was effective. I should like to know whether opportunity for contagion was very great.

Dr. ALFRED F. HESS, New York: Dr. Zahorsky spoke about the deficient immunizing power of children in institutions. I do not think that has ever been proved. That they are more susceptible to infection is true. If you take 100

persons in the almshouse, however, and immunize against typhoid, they will be immunized as thoroughly as 100 private persons. Children in institutions form antibodies, and they can be immunized just as well as children outside of institutions. With regard to a skin reaction with the vaccine, I may say that I tried it, but had no success. There was an unreliable local reaction, but no general reaction. I did say—perhaps I did not make myself clear—that I excluded from consideration all patients confined to bed. All the cases cited were ambulatory. There were two wards of infants in bed. One was a ward with twenty-five children in which there was one case of pertussis. It did not spread because there was no contact. The other was a ward with thirty children between 12 and 18 months old. As there were no cases in that ward, and no exposure to infection, they were excluded. The entire report is of children between the ages of 2 and 6, all runabouts. This answers the question raised by Dr. Lowenburg as to the danger of exposure. Whooping-cough occurred in every ward except the one which I mentioned, although the degree of exposure may have been somewhat different. Nevertheless, so far as we can tell, there was exposure in every ward. The vaccine was given in the early stages—as soon as a child was reported to have whooped, vaccine was given. I do not believe it can be given earlier than in an infant asylum where there is a resident physician. Dr. Heiman has raised the question of influenzal infection. Influenza was found by culture in our laboratory in a large number of these cases. The Bordet bacillus was also found. With regard to curative and prophylactic results I do not believe this prophylactic result is especially brilliant. It failed in 10 per cent. of cases. The result is not nearly so good as with some other vaccines. For instance, typhoid vaccination would be considered poor in results with 10 per cent. of failures. Compared to results in those not vaccinated, however, it is very good. It is very much easier to prevent a disease than to cure it after a considerable infection has occurred.

A NOTE ON THE PREPARATION OF BACTERIAL VACCINES* WILLARD J. STONE, M.D. TOLEDO, OHIO

The work of Vaughan, his associates and others interested in protein poisons has established the relationship of these substances to local and general anaphylactic reactions. Some of the reactions following the injection of bacterial vaccines are undoubtedly due to extraneous medium proteins which have not been removed from the bacterial suspensions in the prevalent process of manufacture.

Since in the preparation of bacterial vaccines we are concerned only with the immunizing properties of the cellular proteins, it should be our aim to reduce, so far as possible, the amount of extraneous proteins in the method employed. Most of the commonly employed mediums used for the growth of bacteria contain protein substances. When the bacterial growth is washed or scraped from the surface of an agar slant, or separated by centrifugation from a bouillon culture, the soluble excretory products of the bacteria, as well as soluble medium products are present in considerable amounts. If such suspensions in salt solution are standardized and used as vaccines, the local and general reaction which follows is apt to be relatively severe, depending on how much extraneous protein happens to be present, and on how soon after preparation the product is injected.

* Read before American Association of Immunologists, Atlantic City, N. J., June 21, 1914.

Since the suggestion was made to me by Dr. Carl C. Warden, who at the time was working with gonococcic vaccines, I have thoroughly washed all bacterial suspensions used in the preparation of vaccines, in the high-speed centrifuge, until the supernatant salt solution (0.45 per cent.) no longer gave a biuret test. The ninhydrin reaction has not been used because of its greater expense. Two or three such washings in the centrifuge will usually suffice to remove most of the extraneous protein. The vaccines so prepared I have called "washed vaccines," since such suspensions are practically free from all unnecessary and undesirable proteins. Washed vaccines possess the cellular elements necessary to immunization, but are free from those proteins which, in many preparations, have been responsible for relatively severe local and general reactions. Washed vaccines are much more suitable for intravenous administration.

Such washing is applicable in the preparation of all bacterial suspensions for vaccine purposes, with the exception of such fragile organisms as the pneumococcus and the gonococcus, the ordinary strains of which autolyze rapidly. Recent work by Sobernheim, by Seligmann and by Warden with more stable mutation forms of organisms offers the hope that less autolysis will take place on thorough washing and that these mutation suspensions may be handled in a manner similar to the suspensions of the more stable organisms.

For purpose of standardization, a suspension of the living, rather than dead, washed organisms is employed. The following method, which is preferable to the blood-cell-slide method of Wright because of greater accuracy, was suggested some years ago by Dr. L. H. Spooner of Boston, and has been used by me as a routine procedure with satisfaction: A small amount of the suspension is drawn into an ordinary erythrocyte mixing pipet, diluting 1:100 with a fairly deep-colored, thoroughly filtered, aqueous carbolthionin stain (the phenol (carbolic acid) content is 0.5 per cent.). The suspension in the counter is well shaken to secure even distribution of cells and a small drop placed on the shallow blood-platelet counting chamber of Helber-Zeiss. The organisms in twenty-five small fields are counted, and the sum divided by 25 to obtain unit value. The number so obtained is multiplied by the dilution 100, by 50 the depth of the chamber, by 400 the number of small squares per cubic millimeter and lastly by 1,000 to convert to cubic centimeters. For example, if forty bacterial cells are counted in twenty-five small squares, the unit value per square would be 1.6, multiplied by 100, by 50, by 400 and by 1,000 or 3,200 millions per cubic centimeter of suspension.

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Observation Must Precede Inference.—Take a group of students who are working at physical diagnosis and it is a constant struggle to keep them making observations and not giving inferences—usually from insufficient observation, if from any at all. No pains are too great to hammer home into the mind of every student the importance of keeping these two processes separate and not taking up the second until the first is as complete as he can make it. It is just as important for the practitioner as for the student, except that in the latter we are trying to form correct habits; the practitioner should have them.—Thomas McCrae, M.D., in the *Canadian Med. Assn. Jour.*

CANCER OF THE PROSTATE*

BERNARD FRANCIS McGRATH, M.D.

ROCHESTER, MINN.

The facts that the general subject of cancer presents even to-day one of our most serious and unsolved problems; that cancer of the prostate is a comparatively frequent and exceedingly distressful form of the disease; and the probability that by a more widespread application of the present available knowledge of this pathologic process the prevalent high percentage of disability and death would be considerably diminished, are advanced as sufficient reason for presenting a discussion of the subject with a contribution of data to the fund of experience.

The pathogenesis of cancer of the prostate is still a debatable question; the frequency of its occurrence, the usual sites of its original focus, its mode of extension and metastasis, are phases of the subject which are reasonably supported by facts.

This paper is based, first, on the examination of a series of 716 prostatic specimens removed at operation in the Mayo Clinic from Oct. 28, 1904, to June 1, 1914; secondly, on the pathogenesis of epithelial tumors of the breast, as view by MacCarty; and thirdly, on a review of the literature.

PATHOGENESIS

The opinions of various investigators with regard to the pathogenesis of cancer of the prostate are not uniform. The cause of this lack of uniformity seems to be due, at least in a great measure, to the different points of view from which the pathologic process is viewed.

Some authors maintain that cancer does not begin in a hypertrophic portion of the gland, that its presence here is an invasion from a focus situated elsewhere in the organ, usually in the posterior lobe. Others state that cancer occurs as an almost imperceptible transition from a benign adenoma. Still others, disregarding as unessential the consideration whether the associated process be one of general hypertrophy, adenoma or other pathologic condition, view, apart from its causation, the pathogenesis of prostatic cancer, likewise of cancer in general, as fundamentally a question of the histogenesis of epithelial cells.

A summation of the evidence adduced from the various investigations emphasizes the fact that cancer occurs in the atrophic, the apparently normal and the hypertrophic prostate. In the light of this accepted fact is seen an indication that involved in the development of the cancerous process there is a study far more basic than what is comprehended in a consideration of associated pathologic conditions. Again, the weight of evidence seems to prove that the disease begins most frequently in the posterior lobe of the gland. This seeming selectiveness of the process, however, is no more explicable in the prostate than are similar phenomena in other organs. The incident of original focus is aside from the underlying principle of pathogenesis, as advanced in the theory of the histogenesis of epithelial tissue.

* From the Mayo Clinic.

* Read before the Section on Pathology and Physiology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

* Because of lack of space, this article is abbreviated in THE JOURNAL by omission of some of the illustrations. The complete article appears in the Transactions of the Section and in the author's reprints.

CANCER OF THE BREAST

In 1898 Albarran and Hallé,¹ in an oft quoted and adversely criticized treatise under the caption, "Hypertrophy and Epithelial Neoplasms of the Prostate," direct attention to the "remarkable analogy between the hypertrophied prostatic gland and the mammary gland affected with benign tumors, or with those epithelial and interstitial lesions, which are still wrongly classified among the benign neoplasms and the chronic inflammations."

In 1907, Ewing,² discussing "Cancer Problems," stated that "inflammatory hyperplasia passes by insensible gradations into neoplastic growths." During the past five years, MacCarty³ has contributed several papers to the subject of cancer of the breast. This author was stimulated to undertake an extensive investigation of the epithelial growths of the mammary gland because of inability to harmonize his daily observations with the prevalent views of the pathogenesis of these tumors and the apparently redundant, diverse and unintelligible classification of the pathologic processes.

With the purpose of endeavoring to determine an analogy between the pathogenesis of cancer of the mammary gland, as advanced by MacCarty, and the pathogenesis of cancer of the prostate, I undertook the examination of this series of prostatic specimens. A brief summary of MacCarty's investigation of epithelial growths of the breast follows:

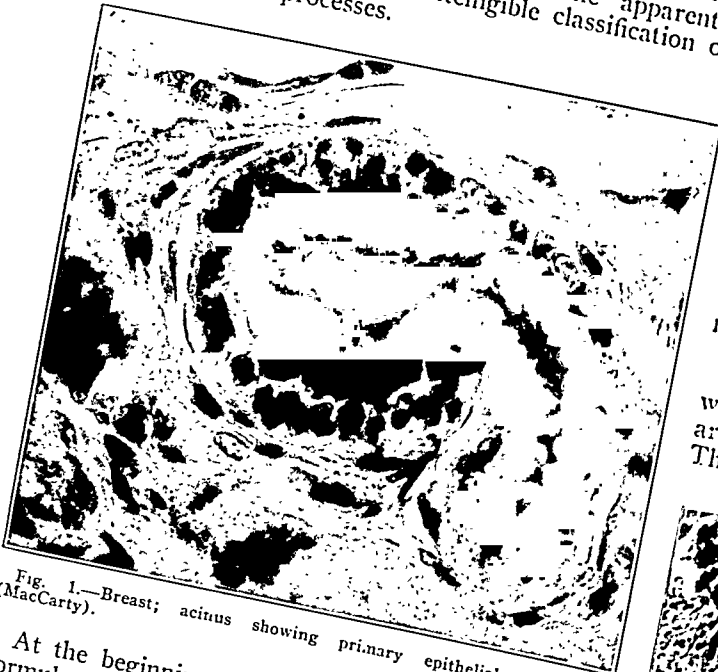


Fig. 1.—Breast; acinus showing primary epithelial hyperplasia (MacCarty).

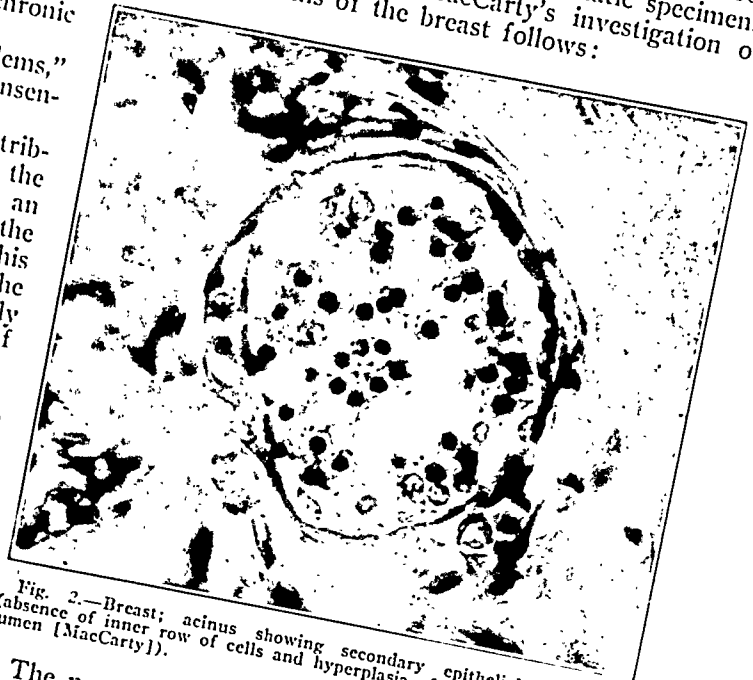


Fig. 2.—Breast; acinus showing secondary epithelial hyperplasia (absence of inner row of cells and hyperplasia of outer row of cells in lumen [MacCarty]).

The normal acinus of the mammary gland is lined with a single row of cylindrical epithelial cells, which are the differentiated, functional cells of the organ. These differentiated cells arise from the stratum ger-

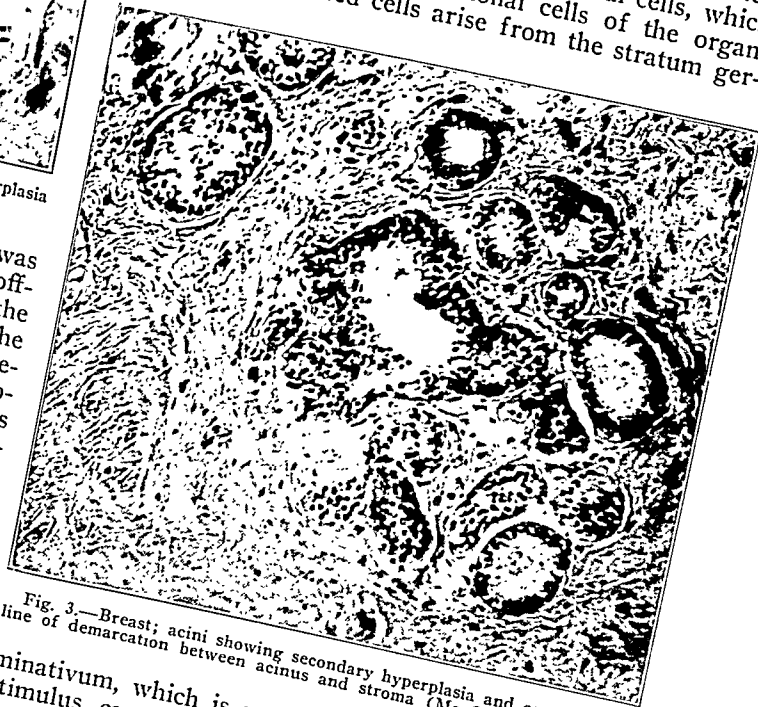


Fig. 3.—Breast; acini showing secondary hyperplasia and confusion of line of demarcation between acinus and stroma (MacCarty).

At the beginning of this work the hypothesis was formulated, that the cells of cancer are the direct offspring of cells normally present in the acinus of the breast, and that they are derived neither from the differentiated cells through metaplasia, nor from the natal or postnatal rests, according to the views attributed to Cohnheim and Ribbert. The investigation has been pursued on the foundation constructed by authoritative embryologists; personal speculation has been scrupulously avoided and notes of conditions have been confined strictly to the morphologic evidence presented by epithelial tissue under the microscope. At the present period of this long investigation, MacCarty states that his earlier observations have been confirmed, and that his view of the origin of cancerous cells in the breast is no longer a hypothesis, but a demonstrable fact.

minativum, which is usually undiscernible until some stimulus causing hyperplasia is present. Then the germinative layer appears in the acinus as a second row of cells which adjoins immediately the surrounding stroma. For descriptive purposes these cells are termed the outer row and are described as the undifferentiated or partially differentiated precursors of the

1. Albarran and Hallé: Ann. des mal. des org. génito-urin., 1898, p. 797.
2. Ewing: Harvey Lectures, Nov. 16, 1907.
3. MacCarty: Tr. of Surg. and Gynec. Assn., 1910; Surg., Gynec. and Obst., October, 1913, p. 441; Surg., Gynec. and Obst., March, 1914, p. 284.

specific functional cells. The morphologic appearance of these cells of the outer row differs from that of the differentiated cells, which now form and are termed the inner row. In the presence of an excessive or abnormal stimulus the cells of the outer row become

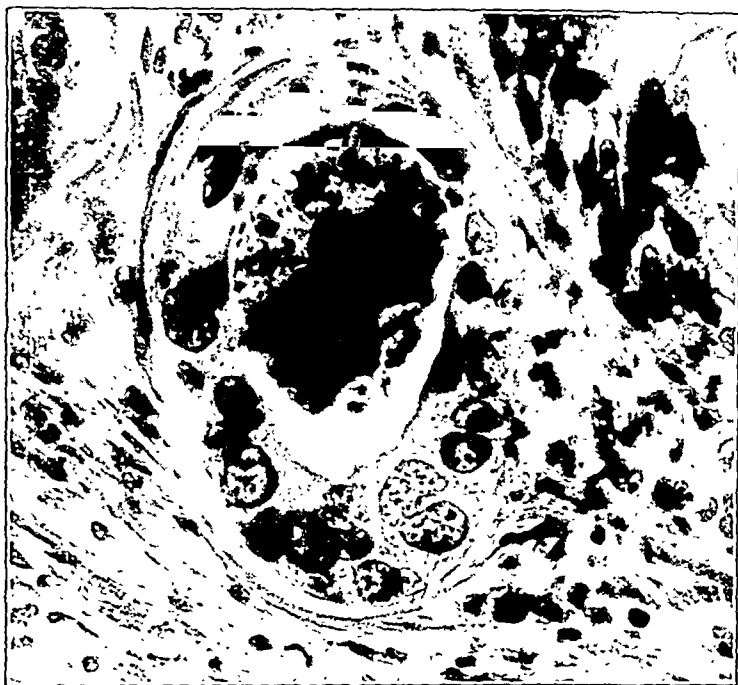


Fig. 5.—Breast; acinus showing secondary epithelial hyperplasia with irregularity of nuclei (MacCarty).

hyperplastic and partially or completely fill the acinus. In this event, the functional cells are present, exfoliated or absent. Furthermore, the undifferentiated cells are observed not only intra-acinic, but also extra-acinic, situated in the stroma. Therefore, some microscopic fields present both rows of cells, differentiated and undifferentiated, distinct in the acinus; other fields

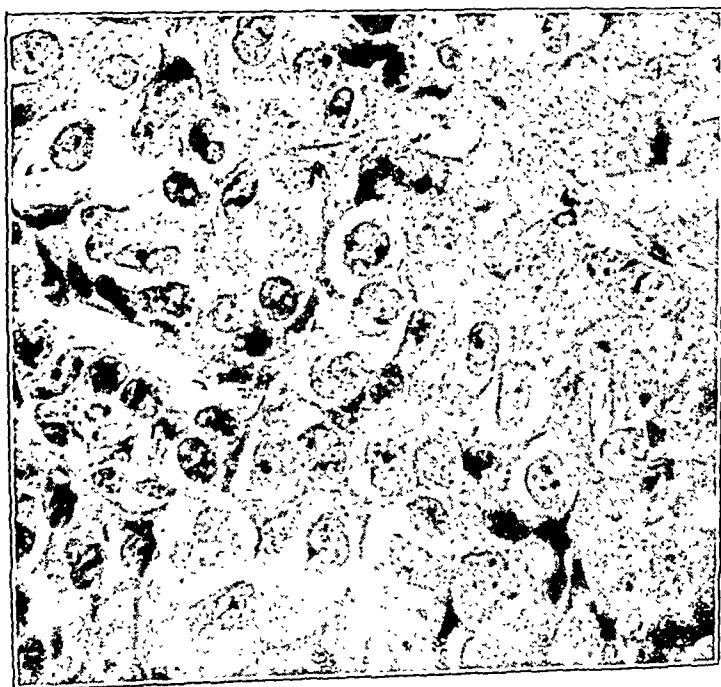


Fig. 6.—Breast; tertiary epithelial hyperplasia, showing irregularities of nuclei—cancer (MacCarty).

show a definite predominance of intra-acinic, hyperplastic undifferentiated cells; and in still others, both intra-acinic and extra-acinic hyperplastic undifferentiated cells are seen. In some fields in which the inner row of functional cells are exfoliated or absent, and

the undifferentiated cells of the outer row hyperplastic, the line of demarcation between the acinus and the stroma is observed obliterated, totally or in part, and the latter cells are noted also in the stroma. The facts that epithelial invasion of stroma is the accepted histologic picture of cancer; that in these observations the epithelial cells in the stroma are morphologically indistinguishable from the hyperplastic undifferentiated cells of the acinic outer row; and finally, that the latter cells represent the normal precursors of the functional cells in the stratum germinativum, seem to lead logically to the deduction that *the cancerous cells of the mammary gland are the direct, immediate descendants of the undifferentiated cells of the germinative layer*, consequently, that the hypothesis of "embryonic rests" is not essential for the explanation of cancer in this organ.

For the sake of simplicity in studying the mammary epithelial tumors, the following classification is based on the observations cited above: The pathologic processes involved in these epithelial growths are designated, (1) primary hyperplasia; (2) secondary hyperplasia; (3) tertiary or migratory hyperplasia. In pri-



Fig. 7.—Normal prostatic epithelium.

mary hyperplasia, both rows of cells, the inner, differentiated, and the outer, undifferentiated, are present and concerned in the reaction; in secondary hyperplasia, the outer row, undifferentiated cells, are excessively proliferated (cancer?); in tertiary hyperplasia, the hyperplastic undifferentiated cells of the outer row are also present in the stroma (cancer).

The probability is advanced that, viewed in the light of these studies, the old criterion for determining cancer histologically, namely, the permeation of the "basement membrane," may be erroneous, consequently, that we may be compelled to view the condition of secondary hyperplasia as possibly malignant before invasion of tissue has occurred.

CANCER OF THE PROSTATE

In examining the prostatic specimens of this series for the purpose of seeking an analogy between the cancerous process in this gland and that noted by MacCarty in the breast, the following observations have been made:

The normal acinus of the prostate is lined with a single or an imperfect double layer of columnar epi-

thelial cells. These are the differentiated or specific functional cells of the gland. In the examination of the pathologic specimens, these functional cells are seen frequently in a state of excessive proliferation, forming projections in and bridges across the acini. There is observed also partial or complete exfoliation of the same cells with the formation of cysts, which are empty or contain accumulations of the cells in varying degrees of degeneration. Some fields are noted in which the acini present not only the proliferated functional cells, but also, outside these and immediately adjoining the stroma, another row of cells, which are morphologically dissimilar to the inner row of differentiated cells. Other fields contain acini with functional cells present, exfoliated or absent, and the lumina partially or completely filled with the hyperplastic undifferentiated cells of the outer row. Still other fields are seen in which these hyperplastic cells of the outer row are both intra-acinic and extra-acinic, consequently presenting epithelial invasion of tissue, the accepted picture of cancer. Furthermore, what is impressive, the three conditions just described have been observed together in the same microscopic field.



Fig. 8.—Normal prostatic epithelium.

An analysis of this comparative study of the prostate and the mammary gland indicates that an analogy exists between the microscopic pictures of epithelial changes in the cancerous process of both organs. The analogy being accepted, it follows that this study of the prostate adds further support to MacCarty's deduction, drawn from extensive observations on epithelial growths of the breast. If adequately prolonged and comprehensive investigations in the future positively confirm the present view of the latter author, it may be stated of the prostate that, whatsoever the associated pathologic condition or wheresoever the original focus, these are factors which are unessential to the process of cancerous development; that this is essentially a process of epithelial hyperplasia, involving the above-described undifferentiated cells, in a state of reaction to an abnormal irritant. Furthermore, for the pathogenesis of cancer it would not be necessary to assume the theory of "embryonic rests."

Frequency.—Statistics indicate that we are indebted to the investigators of the past half century for the existing knowledge of cancer of the prostate. The

first useful statistics were compiled by Thompson⁴ (1854) who cited 18 cases from the English and the French literature. Wyss⁵ (1866) reported 28 cases, including Thompson's; Socin⁶ (1875), 50 cases; Kapuste⁷ (1885), 54 cases; Engelbach⁸ (1888), 144 cases; Wolff⁹ (1899), 110 cases. Since 1902, numer-

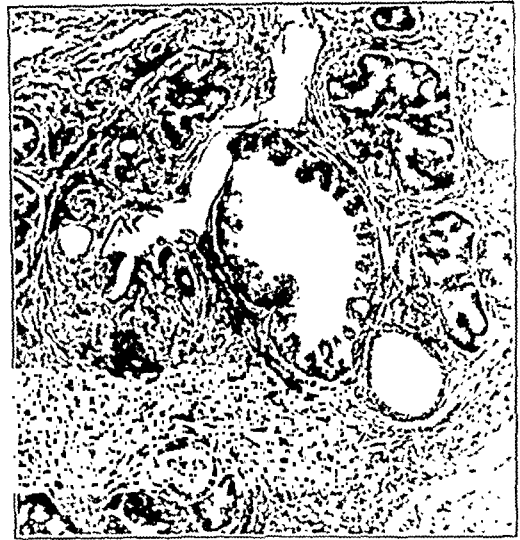


Fig. 10.—Normal prostatic epithelium, proliferating and projecting in masses in the lumen of the acinus.

ous reports of malignant prostatic conditions have been contributed. It is the statistics of the more recent writers, however, which, although varying within somewhat wide limits, afford us the nearest approximation to the truth with regard to the frequency with which cancer occurs in the prostate.

In 500 cases of prostatic obstruction, Young⁶ found cancer in 20 per cent. The same author states that about one out of every seven enlarged prostates after 50 years of age is cancerous. Albarran and Hallé noted 14 per cent.; Walker,⁷ 16.5 per cent.; Wilson and McGrath⁸ (1911), 468 reexamined prostatic specimens

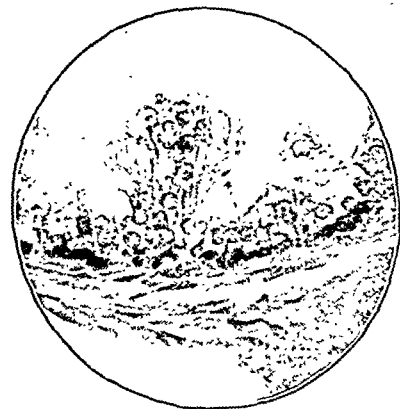


Fig. 11.—Normal prostatic epithelium, proliferating and projecting in masses in the lumen of the acinus.

removed at operation, 15.5 per cent.; Freyer⁹ (1914), 1,276 cases of enlarged prostate, 13.3 per cent. In the

4. Cited by von Frisch, *Der Krankheiten der Prostata*, Ed. 2, 1910.
5. Wolff: *Deutsch. Ztschr. f. Chir.*, July, 1899, lii, parts 3 and 4.
6. Young, Hugh, H.: *Ann. Surg.*, 1909, 1, 1232; *The Early Diagnosis and Radical Cure of Carcinoma of the Prostate*, THE JOURNAL A. M. A., March 10, 1906, p. 699.
7. Walker: *Lancet*, London, April 11, 1908, p. 1054.
8. Wilson and McGrath: *Surg., Gynec. and Obst.*, December, 1911, p. 647.
9. Freyer: *Arch. Internat. de chir.*, 1914, vi, No. 4.

present series of 716 specimens (including the 468 cases reported by Wilson and McGrath in 1911), 12.28 per cent.† are cancer.

Age.—One patient was between the ages of 40 and 50. Seventy-eight per cent. were between 60 and 80. Other investigators have found about 68 per cent.

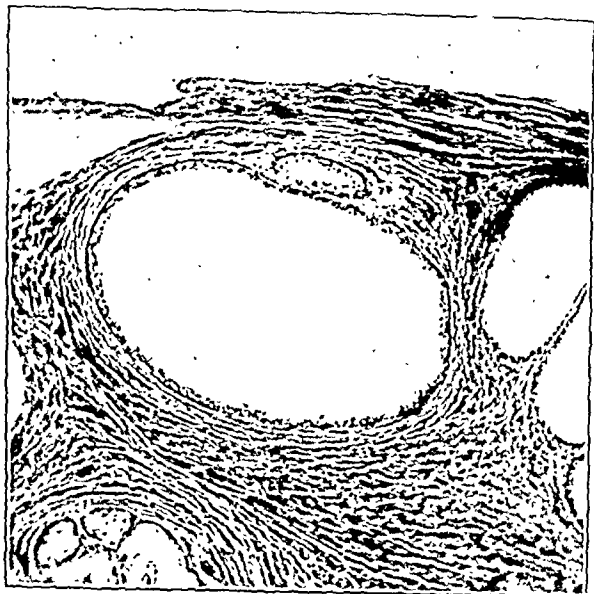


Fig. 12.—Cystic acini, showing two rows of cells, inner and outer row, similar to pictures seen in breast in primary hyperplasia.

between the ages of 50 and 70. Wolff reports six patients under 40; one, 29 years of age.

Mode of Involvement.—Cancer of the prostate is primary in the great majority of cases. The gland is involved secondarily by adjacent cancer or through metastasis by way of the blood-stream. Rectal ulceration is the most frequent source of secondary prostatic cancer from contiguous structures. About one-half the cases of secondary involvement are metastatic from remote organs.

Site of Origin.—The most commonly ascribed site of the original focus in primary cancer of the prostate is the posterior lobe; but its presence in the lateral and middle lobes has been noted by some authors.

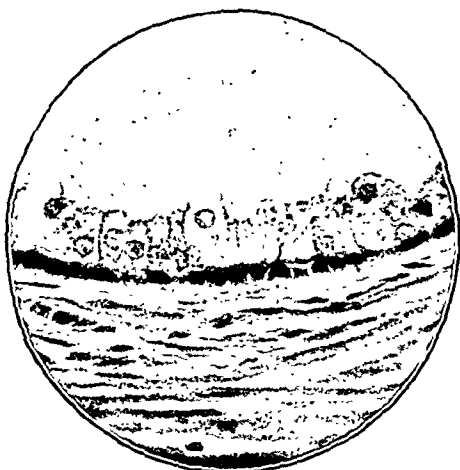


Fig. 13.—Cystic acini, showing two rows of cells, inner and outer row, similar to pictures seen in breast in primary hyperplasia.

Growth.—The cancerous process has been observed to involve the entire prostate symmetrically and rapidly, but the consensus of investigators' opinions is that, in by far the large proportion of cases, cancer of this gland is limited, occurring as one or several

little nodules and of slow growth. Consequently, gross serial sections of the specimen and microscopic examination of every doubtful area are essential for the diagnosis in the great majority of cases. Failure to appreciate this point, also neglect to examine the posterior lobe, are the probable cause of statistics with low percentage of cancer, likewise of inadequate treatment and erroneous prognosis.

Extension.—In the extension of prostatic cancer the fascia of Desnonvillers, also the fibrous capsules, both of the prostate itself, and of hypertrophied spheroids, lobules or lobes, are accredited with an essentially important rôle. Young emphasizes this point. Cuneo and Veau¹⁰ have shown that the fascia of Desnonvillers is a prolongation downward of the peritoneum in fetal life, which projecting in a plane between the prostate and the seminal vesicles in front, and the rectum behind, by virtue of its reduplication doubly inhibits the spread of cancerous cells posteriorly. Consequently, ulceration of the rectum is infrequently seen and periprostatic structures are quite effectively guarded. The tendency, then, of the cancerous process is to extend upward to the region of the ejacula-



Fig. 15.—Normal epithelium in acinus, acinus with exfoliation of differentiated cells, acinus with some exfoliated differentiated cells and invasion (?) of stroma by hyperplastic cells of the outer row.

tory ducts, between the fascia of Desnonvillers posteriorly and the trigone anteriorly. Young maintains that the mucosa and submucosa of both urethra and bladder are very resistant to the malignant invasion. On the other hand, von Frisch¹¹ notes extensive involvement of both these structures. The seminal vesicles are frequently involved, and the growth may extend along the ureters, causing complete obstruction, even rupture. Extension upward for a long distance within the vasa deferentia, without apparent involvement of the outer walls, may occur (Young). Cases noted by von Frisch were: Growth into rectum with subsequent extensive involvement of the sacrum. Growth through the obturator foramen and between the adductors of the thigh. Once the capsule is permeated, the cancerous process spreads extensively.

Metastasis.—This occurs in bones, lymphatic glands and internal organs. Important to be emphasized is the fact that, whereas the primary cancer of the pros-

10. Cuneo and Veau, cited by Bryan: *Lancet-Clinic*, April 20, 1912, p. 433.

11. Von Frisch: *Die Krankheiten der Prostata*, Ed. 2, 1910.

† In the last 248 cases of this series only the specimens already diagnosed cancer were studied. It is probable that reexamination of the remaining specimens will increase the percentage of malignancy.

tate is usually small, metastases from it are commonly extensive. The most frequent sites are the skeletal bones and the lymphatic glands. Visceral metastasis is comparatively infrequent, probably occurring in about 25 per cent. Kaufmann¹² remarks the infrequency of glandular metastasis from prostatic cancer compared with that from cancer of other structures. In 100 collected cases this author found involvement of the pelvic glands 27 times; iliac, 24; inguinal, 16. Young, whose figures agree with those of Kaufmann as to the involvement of the pelvic glands, says: "It shows the fact that one should not expect enlarged glands before making a diagnosis of carcinoma of the prostate." Blumer¹³ states that cancer of the prostate gives rise to metastasis in bones in a much larger proportion of cases than any other form of cancer—probably in two-thirds of patients in whom it is allowed to run an unobstructed course. Von Recklinghausen¹⁴ emphasizes the fact that the cancerous focus in the prostate is, in comparison with the advanced foci in the bone, small and insignificant. The author directs attention to the analogy between metastasis in bone from a small nodule of cancer in the female



Fig. 16.—High power of acinus in Figure 15, showing both exfoliated differentiated cells and hyperplastic cells of the outer row.

breast and that from cancer of the prostate, and gives warning to suspect these sources in case of severe pain in the spinal column without evident cause. Blumer advises similarly in case of spastic paraplegia—involvement of the spine—and apparent osseous tumors in flat and long bones. In the thyroid, likewise, certain forms of malignant tumors occur which present entirely analogous relations, and such growths may be so small as to escape attention (von Eiselsberg¹⁵). The metastasis in bone is more or less general, its transmission is vascular rather than lymphatic and nearly always originates in the medulla—rarely beneath the periosteum (Blumer).

SUMMARY

1. An analogy exists between the microscopic fields of epithelial changes observed in cancer of the pros-

tate and those of the mammary gland, as presented by MacCarty.

2. In the undoubted histologic picture of cancer, both organs present in the stroma migratory epithelial cells which are morphologically indistinguishable from the hyperplastic undifferentiated cells within the acinus.

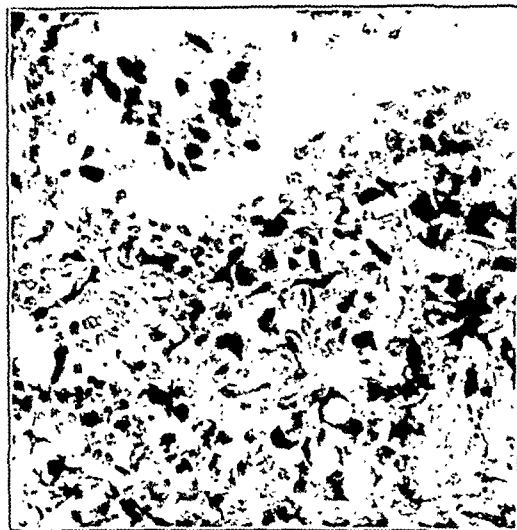


Fig. 17.—Acinus in Figure 15, in which there are exfoliation of differentiated cells, hyperplastic cells of the outer row and immediate peri-acinus invasion of stroma by hyperplastic cells of the outer row.

3. According to the studies of MacCarty, these intra-acinic, hyperplastic, undifferentiated cells represent the precursors of the specific functional cells of the gland; consequently, the positively cancerous cells are the direct, immediate descendants of those which become the differentiated cells under normal conditions.

4. This analogy between the prostate and the mammary gland being accepted, further support is



Fig. 18.—Acinus showing the two rows of cells, acinus showing the hyperplastic cells of outer row, completely filling the lumen.

added to MacCarty's deductions, drawn from extensive studies of the breast. And, if adequately prolonged and comprehensive investigations in the future confirm the present view of the latter author, then it may be stated of prostatic cancer, as well as of cancer in general, that the process is fundamentally one of

12. Kaufmann: *Lehrbuch der speziellen pathologischen Anatomie*, Berlin, 1901.

13. Blumer: *Johns Hopkins Hosp. Bull.*, July, 1909, p. 200.

14. Von Recklinghausen: *Festschr. zu Virchow 71. Geburtstag*, Berlin, 1891.

15. Von Eiselsberg: *Arch. f. klin. Chir. (Langenbeck)*, xlv, 1893.

epithelial hyperplasia of the above-described undifferentiated cells, in a state of reaction to an abnormal irritant; furthermore, that for the pathogenesis of cancer it would not be necessary to assume the theory of "prenatal or postnatal rests."

5. Cancer of the prostate is a comparatively frequent disease after 50 years of age.

6. The process usually begins in the posterior lobe and occurs more commonly as a small nodule or

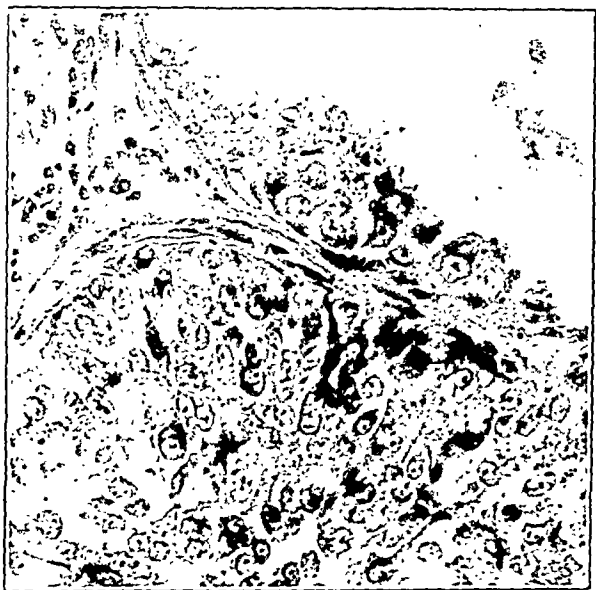


Fig. 20.—Same as Figure 19, showing in upper acinus primary and secondary hyperplasia; in lower acinus, secondary hyperplasia.

nodules of slow growth; consequently, *careful investigation of the posterior lobe, gross serial sections of the specimen, with microscopic examination of doubtful areas, are essential for diagnosis in the majority of cases.*

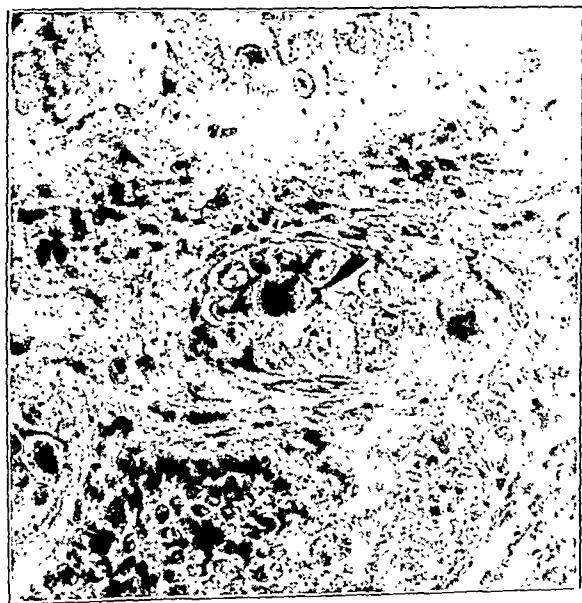


Fig. 21.—Same slide as Figures 18, 19 and 20, showing hyperplastic epithelial cells in the stroma, probably a lymphatic space (tertiary epithelial hyperplasia, or cancer). The cells are morphologically indistinguishable from the intra-acinic hyperplastic cells of the outer row (secondary hyperplasia).

7. The fascial strata associated with the prostate seem to be quite effective barriers to the progress of the disease.

8. The tendency of extension of the cancerous process is upward to the region defined by the fascia of Desnonvillers posteriorly and the trigone anteriorly, and then beyond this area.

9. Metastasis affects bones, lymphatic glands and internal organs. The cancerous focus in the prostate may be, and commonly is, insignificant, while the metastasis in bone is extensive. Similar relations have been observed with small cancerous nodules in the female breast and the thyroid. Manifestations in bone, with cause obscure, should direct attention to these observations.

10. Involvement of lymphatic glands is not a dependable factor in diagnosis, since metastasis may be present in the skeletal structure and these glands apparently unaffected.

A COMMON MECHANISM FOR MOST INJURIES OF THE SHOULDER REGION

SUPPORTED BY THE RESULTS OF TREATMENT, INCLUDING FORTY-NINE OPERATIONS *

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PHILADELPHIA

During the past six or seven years I have been making a study of a series of traumatic conditions affecting the shoulder and arm, and have presented a special study of each condition. The views expressed have been radical because they were based on a new

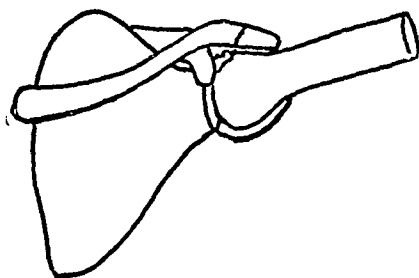


Fig. 1.—Humerus at normal limit of abduction. Leverage effect begins when capsule tears, which usually occurs at the glenoid or humeral attachment. Each of the diagrams on effects of hyperabduction on skeleton of shoulder region includes, except Figure 10, the clavicle, scapula, upper half of the humerus and capsule of the shoulder-joint.

conception of the etiology. The clinical experience by which they were supported was small because the methods of treatment were new and because the "let alone treatment" has been the rule in most of these cases. Of one of these conditions, recurrent dislocations of the shoulder, I recently reported the results of operation on eighteen shoulders, the largest number previously reported by one writer being four. I have since operated on four more. My particular purpose, now, is to show that they can be traced to an essentially common cause, and that the views offered have a rational anatomic basis and are justified by the results of treatment. It is important to bear in mind that we are dealing here with conditions that have always been the subject of much discussion and conjecture.

The conception of the anatomic basis of these conditions was of gradual development. For more than ten years I had been working on the applications of anatomy to surgery, with the cadaver as the basis of the work. There is no essential difference in the signs

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

* Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

obtained in a dislocation of the shoulder on the cadaver produced by hyperabduction, and in the usual dislocation of the shoulder in life, which is generally admitted to be due to hyperabduction. The best knowledge we have of dislocations of the shoulder and hip has come from studies of cadaver dislocations. If methods of treatment founded on such studies produce distinctly better results than those in vogue and not supported by such work, then they should and, I believe, will receive the consideration of the profession. For a

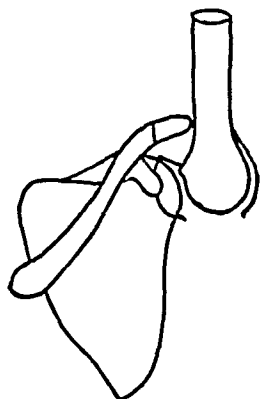


Fig. 2.—Capsule torn extensively from glenoid margin, head pried out of socket and humerus moved downward on edge of acromion. In recurrent dislocations, gap between torn capsule margins is later bridged across by new cicatricial capsule.

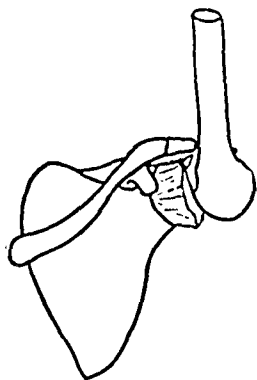


Fig. 3.—Capsule torn from humeral attachment in whole circumference, taking with it a fragment of greater tuberosity. This lesion is sometimes responsible for flail shoulder-joint.

fuller discussion of the various phases of the work, I must refer the reader to previous papers, references to which will be given later. My object now is to present a perspective outline of the whole subject, and this demands brevity.

It is of much importance to know the mechanism by which an injury to the skeleton is produced. We know very little about this whole subject. Concerning

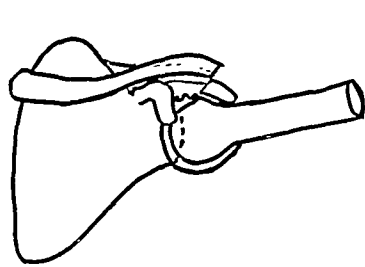


Fig. 4.—Upward dislocation of outer end of clavicle from hyperabduction.

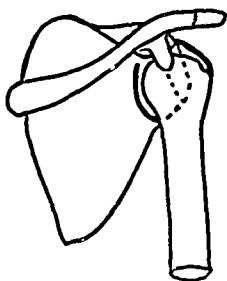


Fig. 5.—Anterior dislocation of shoulder with arm at side. Upper portion of capsule unruptured.

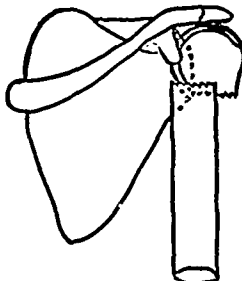


Fig. 6.—Fracture of surgical neck of humerus. Upper end of lower fragment displaced upward, forward and inward, like the head of the humerus in anterior dislocation of the shoulder.

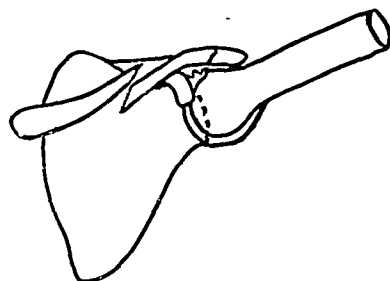


Fig. 7.—Fracture of middle of clavicle from hyperabduction. Outer fragment forced downward and inward like acromion in Figure 4.

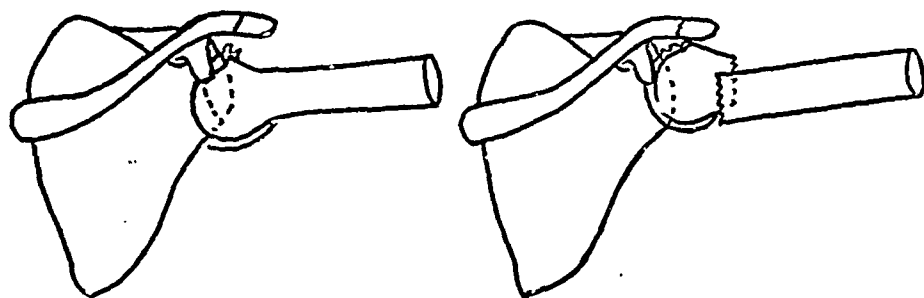
fractures and dislocations, even our largest systems of surgery have little more to say than that they are due to direct or indirect violence. We cannot rely much on the statements of the patients as to how the force was applied. They were too excited at the time and usually do not know until later where the force was expended, and then only in a very vague way. The relationship between cause and effect is more obvious in injuries of the skeleton at the ankle and wrist than in any other part of the body, probably because of their proximity to the part of the body

coming in contact with the ground or injuring object. In these injuries we recognize more clearly the effects of the falls on the palm of the hand and the turning of the foot inward or outward due to the lateral instability of the foot. In no other parts of the body is there the same unity of opinion concerning the mechanism of fractures and dislocations. My whole case has been built up on the hypothesis that hyperabduction is to shoulder injuries what forced dorsal flexion is to wrist injuries and the lateral turns of the foot are to injuries of the ankle. But the influence of hyperabduction is not so obvious. A little reflection, however, will show that no movement at the shoulder is forced as frequently and violently as abduction. Only the muscles and joint ligaments on the axillary side resist, and as the capsule is an integral part of the skeleton it must suffer more than any other soft structure from the forces applied to the skeleton. It has been my contention that in falling, if conscious, a person practically never strikes on his shoulder, and I regard it as very important that Codman, who has been a close student of shoulder injuries, agrees with this contention. I believe that in falling one practically always puts out his hand to break the force of the fall and that the effect at the shoulder is to carry the arm into abduction. The only pathologic effect of hyperabduction at the shoulder that is generally recognized is the anterior dislocation, and even in this condition we have not appreciated its full importance. In my opinion, it is the key to the solution of the obscurity in most shoulder injuries.

I wish to suggest here how it may explain other injuries to the skeleton than at the shoulder-joint. The lateral turns of the foot produce sprains and sprain fractures, Pott's fractures, lateral dislocations of the subastragaloid joint and even of the ankle-joint, and probably other injuries to the skeleton, also. At the shoulder, what do we know, for instance, of the mechanism of fractures and dislocations of the clavicle, or fractures of the surgical neck of the humerus? We know practically nothing, so that a plausible suggestion

should be worth while. Without movement of the scapula, abduction is arrested at or a little above the horizontal by tension on the axillary portion of the capsule which turns the scapula on further abduction (Fig. 1). When the normal limit of abduction is passed, some part of the skeleton gives way. In adults, in the great majority of cases, this is probably the shoulder-capsule, which includes all the ligaments of the shoulder-joint; but why should not other parts of the skeleton break, here, as at the ankle? My cadaver studies show that the first effect of hyper-

abduction at the shoulder-joint is to tear the axillary portion of the capsule. Then the outer surface of the humerus just below the tuberosities strikes the edge of the acromion, when further abduction pries the humeral head out of its socket below and anteriorly (that is, into the axilla), the humerus sliding on the acromion at their point of contact (Fig. 2). But the dislocation is the end-result of hyperabduction and requires an extensive tear of the capsule. Between the force necessary to produce this severe result and



Figs. 8 and 9.—Same as Figures 5 and 6, with humerus in about same plane as clavicle and acromion, showing same displacement of outer fragment as in Figures 4 and 7.

that which the capsule can withstand without tearing, there will be many grades applied, producing lesser tears or sprains of the shoulder-joint. There are, in all probability, many cases in which dislocations are spontaneously reduced as the arm falls to the side of the body. Most traumatic stiff and painful shoulders are probably due to lacerations of the axillary portion of the capsule produced by hyperabduction. But with the tearing of the capsule, or without it, a neighboring part of the skeleton may give way.

It is a significant fact that fracture of the surgical neck of the humerus is not infrequently associated with an anterior dislocation of the shoulder. It is more than likely, in such cases, that both lesions are due to the same mechanism, and it is generally agreed that the dislocation is due to hyperabduction. The limitation of movement in the shoulder-joint, fre-

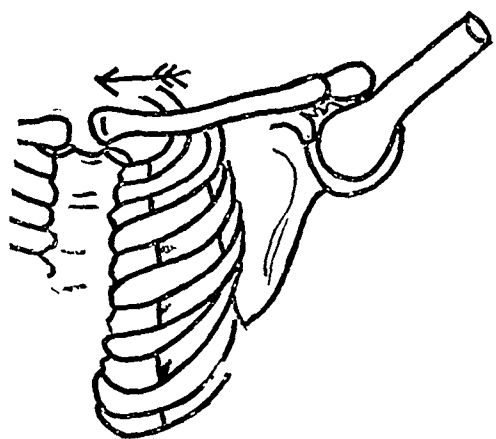


Fig. 10.—Upward dislocation of inner end of clavicle from hyperabduction. The relation of the sternum to the clavicle prevents the downward displacement of the latter.

quently observed and often severe after fracture of the surgical neck without dislocation, could be explained by a simultaneous tear of the capsule, with or without a simultaneously reduced dislocation. The fracture would represent the breaking of the lever, the humerus, at the fulcrum, the acromion (Fig. 1). Mencke¹ has recently called attention to the frequency of fractures of the acromion, which may be explained as the giving way of the fulcrum itself. I shall call

attention, briefly, to other fractures of the fulcrum, later. Mencke found that in some cases the fracture of the acromion was associated with anterior dislocation of the shoulder, which in these cases, at least, is strong evidence that the fractures were due to hyperabduction. Fractures of the greater tuberosity of the humerus are well known to be frequently associated with anterior luxations of the shoulder. I have obtained about ten or twelve typical fractures of the greater tuberosity simply by producing anterior dislocations of the shoulder in the cadaver by hyperabduction. In each instance the capsule tore from its humeral attachment, the continuing abduction tearing the capsule progressively upward to the greater tuberosity which was detached, the varying-sized fragment maintaining its attachment to the corresponding portion of the capsule (Fig. 3) and the overlying rotators. I have operated in several cases and have also had several cadaver dislocations in which the capsule tearing from the glenoid margin carried

with it a fragment of the glenoid. These fractures, therefore, seem to depend on the manner in which the capsule tears from hyperabduction.

The fulcrum, in the leverage mechanism of hyperabduction, is the acromion. But the acromion is attached to the rest of the skeleton by the clavicle, which, therefore, becomes an important part of the fulcrum. This may break at any point, but is more liable to do so at some points than at others. Of the two clavicular joints, the outer gives way much more frequently than the inner, while the clavicle breaks most frequently about its middle where it is thinner and least protected by muscles and ligaments. In his fractures of the acromion, Mencke included cases in which a small fragment was detached from its articulating surface with the outer end of the clavicle. I have seen one case of this kind and several others in which the Roentgen ray failed to show such a fracture, but in which the pain following an injury to the shoulder was sharply localized to this joint. I have had two cases in which an upward dislocation of the outer end of the clavicle (by far the most frequent variety) was associated with an anterior dislocation of the shoulder which indicates that both resulted from hyperabduction. The line of this joint is slightly oblique from above downward and inward, the obliquity varying



Fig. 11.—Left shoulder injured three years ago. Severe paralysis appeared on following day. Total paralysis of hand four weeks later when shoulder ankylosis was broken up under ether. Returned to work in six weeks with limb weak, especially hand. Normal power and motion in one year. Picture taken one week ago showing patient supporting 40-pound dumb-bell with left arm, which is about as strong as right.

1. Mencke: Ann. Surg., 1914, lix, 233.

in different cases. The effect of the leverage mechanism at this joint is to crowd the acromion inward against the outer end of the clavicle, and if the force is strong enough, to drive the acromion under the clavicle because of the favoring obliquity of the joint and the tendency of the lever to turn the outer end of the acromion upward and the inner end downward (Fig. 4). The force expended at this joint may be sufficient only to cause a painful joint by the strain on or tearing of the ligaments, the contusion from crowding the bones together, or the fragmentation of the apposed articulating surfaces.†

If we regard these four conditions as fractures of the skeleton with overlapping of the fragments, we shall find that the typical deformity is the same in all. In the anterior dislocation of the shoulder (Fig. 5) and typical fracture of the surgical neck of the humerus (Fig. 6), the lower fragment is displaced upward, inward and forward, while in the fracture of the clavicle (Fig. 7) and dislocation of its outer end (Fig. 4), the proximal fragment is displaced downward, inward and forward. The difference here is only apparent, for if the humerus is abducted until it is in the same plane as the clavicle and acromion, then the upward displacement of the humerus in the fracture of the surgical neck and anterior luxation of the shoulder-joint becomes a downward displacement (Figs. 8 and 9) as

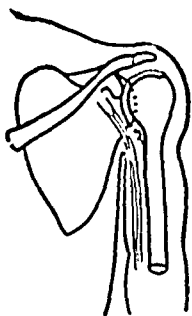


Fig. 12.—Showing relation of branches of brachial plexus to torn axillary portion of shoulder capsule. Hemorrhage from this and other injured tissues with synovial fluid from opened joint extravasates around and into the nerves and with the resulting inflammatory exudate produces a palsy of the limb of varying grade and distribution. The torn and relaxed capsule is shortened by the cicatricial healing.

in the fracture and luxation of the clavicle. This similarity in the usual deformity in all of these conditions suggests strongly a common mechanism, hyperabduction, which we agree is responsible for one of them, the anterior dislocation of the shoulder. The well-known greater frequency of fractures of the clavicle in children and dislocations of the shoulder in adults could be explained by a relative difference in strength of these two portions of the skeleton at these two periods in life. The great infrequency of dislocations of the inner end of the clavicle and the usual upward displacement of the proximal fragment in this fracture of the skeleton are readily explained by the conformation of the joint (Fig.

10), which absolutely prevents a downward displacement of the proximal bone or fragment as in the other fractures of the fulcrum. It tends to neutralize the effect of the force and thus to diminish the number of dislocations. The leverage mechanism might crowd the inner end of the clavicle upward in rare cases, but it cannot force it downward as it does in the other fractures of the skeleton referred to. I have offered, here, these few brief suggestions concerning other breaks in the skeleton than at the shoulder-joint to show that, probably, we have overlooked the possibilities of hyperabduction in the shoulder region. My particular interest is in its effect on the shoulder-joint.

STIFF AND PAINFUL SHOULDERS²

According to my conception, the very frequent stiff and painful shoulders, which have been so obscure and the subject of so much discussion, represent the same condition at the shoulder as follows sprains and dislocation in other joints. The characteristic limitation of abduction and external rotation results from immobilization of the arm in the "sling" position, that is, in adduction and internal rotation. A varying grade of palsy is always present in the early stages and is due to the inclusion of some or all of the branches of the

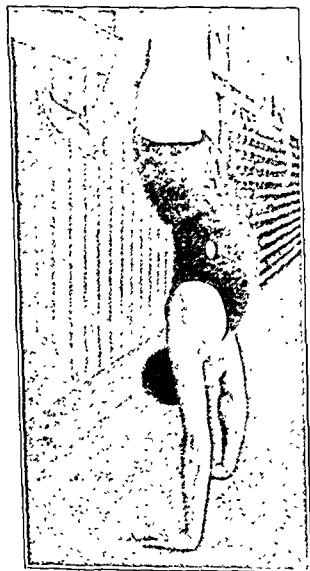


Fig. 13.—Left shoulder operated on for recurrent dislocations, Dec. 29, 1909. Same shoulder dislocated in wrestling, Nov. 25, 1912. Patient has again taken up wrestling. This picture taken a few weeks ago. Obviously more severe strain in getting into than maintaining this position.



Fig. 14.—Patient operated on six and a half years ago for recurrent dislocations of right shoulder. No recurrence of dislocation since. Patient supporting whole weight by hanging from right hand.



Fig. 15.—Same patient as in Figure 14 supporting his whole weight by standing on right hand.

brachial plexus in the consequent axillary inflammation. This is usually mild and soon disappears with the return of normal motion to the shoulder joint. In some cases it is severe, affects most the muscles of the shoulder region, but in rare cases it involves most the muscles of the forearm and hand (Fig. 11). The therapeutic indication is to restore normal motion by exercises to stretch or forcible manipulations under ether to tear the contracted axillary tissues, especially the capsule (Fig. 12).

RECURRENT DISLOCATIONS OF THE SHOULDER³

If after the reduction of a dislocation of the shoulder, the arm is not kept at the side and is soon carried forcibly into abduction, particularly if external rotation is added, the humeral head is easily pried out of the socket again because the capsule has not had time to heal. Its torn edges are again forced apart and

2. Thomas: Am. Jour. Med. Sc., April, 1911; Therap. Gaz., April 15, 1913.

3. Thomas: Am. Jour. Med. Sc., March, 1909; Recurrent Anterior Dislocation of the Shoulder, THE JOURNAL A. M. A., March 12, 1910, p. 834; Surg., Gynec. and Obst., January, 1914.

† Recently, Sievers, in the Trendelenburg Festschrift of the Deutsch. Zeitschrift für Chirurgie, cxxix, 583, presented an extensive study, showing that injuries of this joint are frequent.

the repetition of this accident will leave them permanently separated by the width of the gap necessary for a dislocation, the gap becoming filled in by new cicatricial capsule, much as the gap in a divided Achilles tendon is filled in. The lengthened axillary portion of capsule will not now contract and a recur-

This was a complete failure. The other four (non-epileptics) were successful later, because the condition produced by the dislocation, with the arm kept at the side four or five weeks, induces a cicatricial contraction of the axillary portion of the capsule just as it does after a recent dislocation. After operation the capsule must tear before a dislocation can take place, so that if advantage is taken of this fact the capsule may become as strong or stronger than before the dislocation. For this reason the patients are encouraged to make the fullest use of the arm and are told that the condition necessary for a recurrent dislocation will not return (Fig. 13). In this way the possibilities of the repaired shoulder are developed and the usual persistent fear of a recurrence is done away with (Figs. 14 and 15).

BRACHIAL PALSY FROM INJURY TO THE SHOULDER REGION⁷

The obvious cause of a brachial palsy following an injury to the shoulder region is an injury to the nerves supplying the part paralyzed. The prevailing view is that they are due to a more or less complete rupture of one or more roots of the brachial plexus. I have tried to show that most of them, in adults, are due to the inclusion of the branches of the plexus in the axillary inflammation consequent on a laceration of the axillary portion of the shoulder-capsule (Fig. 12). I wish to state moreover that nearly all the cases which have come under my observation have been associated with an ankylosis of the shoulder-joint and a characteristic limitation of abduction and exter-

rent dislocation is established. Shortening by overlapping or folding of the lengthened capsule is indicated.

Five years ago I reported the first case in which the operation was done through the axilla and was the first to exclude all other causes than the lengthened axillary portion of capsule. I have now done the operation on twenty-two shoulders. Telford⁴ did it in two cases and recommended it highly. Stimson⁵ spoke of it as the ideal operation, and, recently, Schultze⁶ excluded all other causes than the relaxation of the axillary portion of the capsule and favored the axillary operation, although it was not done in any of his cases. A 4- or 5-inch incision is made posterior to the axillary vessels, no muscles are divided, no sutures except those in the skin remain, those used to overlap the capsule being withdrawn when the arm is in the Velpeau position so that the overlapping cannot afterward be disturbed, and ligatures are rarely necessary. The only infection was due to a tense capsule suture that grasped too much tissue and was tied too tightly, causing necrosis. This was in the third case operated on and it cannot occur again because no capsule sutures are employed.

In five cases a dislocation occurred after operation from severe violence with the arm in abduction and external rotation, and in one case after two operations in an epileptic with powerful convulsions and a large defect in the humeral head.

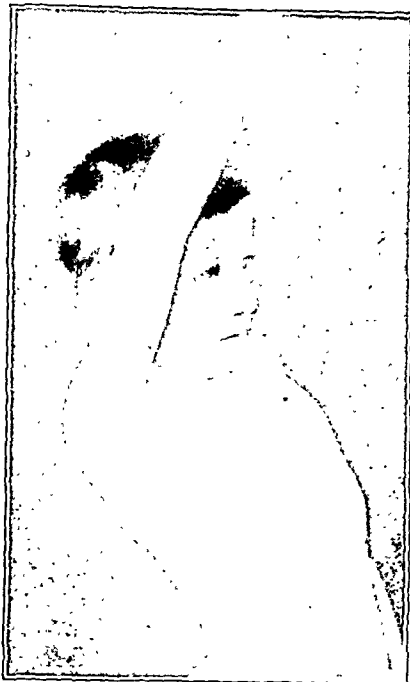
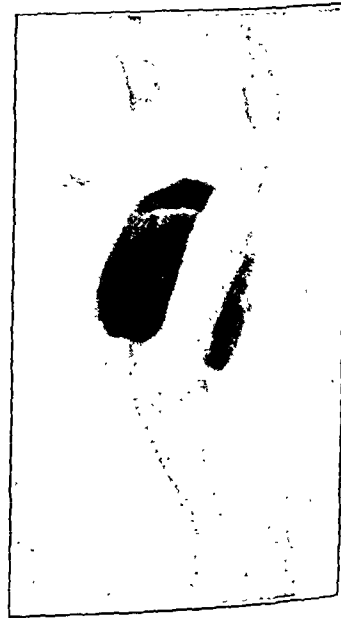


Fig. 17.—Obstetric palsy with posterior subluxation incompletely reduced by operation at 7½ years of age. No paralysis now. Range of movement and power very similar to that in case of old unreduced dislocation of shoulder in adult (Fig. 21).



Fig. 16.—Typical position in obstetric palsy. Mother said to have recognized dislocation of shoulder one week after birth.



Figs. 18 and 19.—Complete palsy of right arm at birth. Then ascribed to rupture of the brachial plexus. Right limb as strong and as large as left now. Slight limitation of abduction and external rotation due to mild posterior subluxation of shoulder.

nal rotation, the disappearance of which was followed by a return of the normal power. The key to the solution of the problem is the anterior dislocation of the

4. Telford: *Lancet*, London, Aug. 5, 1912.

5. Stimson: *Fractures and Dislocations*, 1912, p. 668.

6. Schultze: *Arch. f. klin. Chir.*, 1914, No. 1, p. 38.

7. Thomas: *Ann. Surg.*, January, 1911, *ibid.*, February, 1914.

shoulder in which we know an extensive laceration of the capsule occurs. The brachial palsy in the newborn resulting from injury to the shoulder region during delivery is generally agreed to be of the same nature and due to the same cause as that in the adult, an injury to the brachial plexus. My experience and

study lead me to believe that most of them are the results of injuries of the shoulder-joint as in adults. That birth-palsies are due to injuries of the skeleton in the shoulder region and not to injuries of the brachial plexus is not a new suggestion. Küstner,⁸ in 1889, argued at length to show that they were due to separations of the upper epiphysis of the humerus and that those with deformity were due to displacement of the diaphyseal fragment backward or forward. The evidence is rapidly growing which will show that these displacements are almost always due to posterior subluxations of the shoulder-joint. Küstner suggested that mild obstetric palsies in which the paral-

ysis disappeared in a few days might have been due to blood extravasations the pressure of which paralyzed the nerves. Von Bramann⁹ quotes Vogt to the effect that in congenital dislocations of the shoulder there was a paralysis due to the displacement in the shoulder-joint. Von Bramann believes that the muscles suffer from their inactivity without being paralyzed.

According to my conception, the adult and the birth cases are similar because they are both due to injuries of the shoulder-joint, the basic lesion in both being that of a dislocation of the shoulder. In the adult, when there is no dislocation, complete recovery ultimately results in the great majority of cases. This seems to be true of the birth palsies. When the dislocation persists in the adult, there remains a permanent crippling of the arm and a considerable palsy which in the early stages was much more severe. The condition is very similar in the child when there is a dislocation present (compare Figures 17 and 21). The more delicate muscles and nerves in the child will account for a more severe palsy in all stages, but the improvement in them is also very marked as the years go by. The treatment based on this conception gives far better results than that based on a supposed rupture of the brachial plexus. F. Lange,¹⁰ who has adopted the theory of a shoulder-joint origin, says that the day for the "let alone" treatment of obstetric palsy has passed by. The great need at the present time is to recognize the mild grades of posterior subluxation in these cases. It will often take careful

examination to determine the absence of the normal rounded prominence of the humerus in front of the acromion and the slight prominence of the head behind the acromion where there should be a slight depression.

OLD UNREDUCED DISLOCATIONS OF THE SHOULDER¹¹

From cadaver and clinical study it was assumed that the chief obstacle to reduction was in the cicatricial changes in the torn and now abnormally arranged capsule, some portions healing short and resisting the reduction. As the head left the socket with the arm in abduction, the best method of reduction should be to drag the head back into the socket with the arm in the same position. This would be applying to the shoulder the Allis principle for the reduction of dislocations of the hip. The Kocher method is the application to the shoulder of the Bigelow principle for the reduction of dislocations of the hip. By fixing the scapula firmly and confining the traction to the humerus, the force applied will be confined to the structure holding the scapula and humerus together, that is, the cicatricially altered capsule which must be torn before the head can be moved from its dislocated position. Very severe traction was made in nine cases (see summary), but caused no troublesome symptoms in any. The same method proved successful in recent dislocations of the shoulder.

BRACHIAL PARALYSIS WITH FLAIL SHOULDER-JOINT¹²

Brachial paralysis without the flail shoulder is much more common than with the flail shoulder. The injury to the brachial plexus is assumed to be responsible for both, but we have no explanation for this very important difference in the results of this lesion. The cases without flail shoulder practically always recover with the return of normal motion to the shoulder-joint. I believe there was not a case on record of recovery of the flail shoulder type until I reported two such recoveries three years ago (Fig. 22). These recoveries followed merely the operative removal of the flail shoulder within eight weeks after the causal injury and the restoration of the normal motion to this joint (see summary). My conception of the etiology of these cases is that they are due to the same mechanism as those without flail shoulder, except that the attachments of the capsule and rotator muscles are so torn that the humerus falls away from the socket until it is supported by the surrounding uniform muscles and other tissues (Fig. 3).



Fig. 20.—Obstetric palsy at birth without dislocation of shoulder. Now has evidence of old injury at elbow and very slight limitation of abduction and external rotation in affected (right) shoulder. No evidence of paralysis now. Uses right arm freely and powerfully as left.

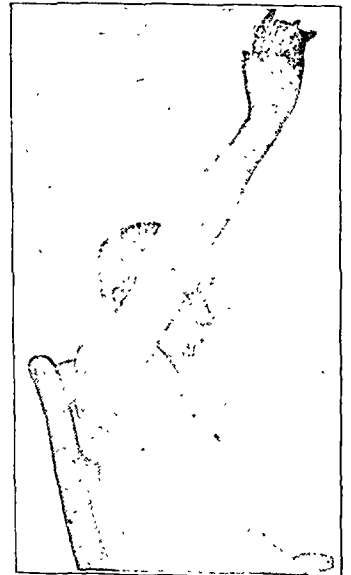


Fig. 21.—Dislocation of right shoulder three years ago. Still unreduced. Movement and power much improved by exercises during past year, favored, probably, by wearing away of dislocated bones where they are in contact (see Fig. 5).

8. Küstner: *Handbuch der Geburtshilfe*, 1889, p. 301.
9. Von Bramann: *Arch. f. klin. Chir.*, 1906, lxxxi, 357.
10. Lange, F.: *München. med. Wchnschr.*, 1912, No. 26.

11. Thomas: *Ann. Surg.*, January, 1913.

12. Thomas: *Jour. Nerv. and Ment. Dis.*, 1911, xxxviii, No. 4.

SUMMARY OF CASES AND RESULTS OF TREATMENT

The treatment in each condition has been based on new conceptions as to etiology. This is less true of recurrent dislocations than of any of the other conditions, the contraction of the capsule having been done occasionally for about thirty years. In January of this year, I published the results of this operation in eighteen shoulders. In April, Schultze reported the late results in thirteen shoulders operated on in Bier's clinic since 1908. I have now operated on twenty-two shoulders. These are the only two reported groups of cases in which a satisfactory comparison of results can be made.

SCHULTZE'S CASES

Since 1908 capsulorrhaphy done in.....	16 shoulders
Late results investigated in.....	13 shoulders
Recurrence of dislocation (regarded as failures) in	7 shoulders
No recurrence in.....	6 shoulders
Shortest interval since operation, 1¼ years.	

AUTHOR'S CASES

Since Jan. 18, 1908, capsulorrhaphy in.....	22 shoulders
Recurrence of dislocation in	5 shoulders
No recurrence	17 shoulders
(Excision later in one of these.)	

Of the 5 cases with recurrence after operation, 4 were later made successful without operation and 1 was a failure after two operations. Operations in epileptics... 7 cases Successful (no recurrences) 6 cases Failure in 1 case

Old Unreduced Dislocations in Adults

Non-operative reduction successful:
After 8 months; 4 months; 8 weeks (with fracture of shaft of humerus); 25 days, and 16 days.
Non-operative reduction failed after 3 months; excision; fatal from hemorrhage.
Reduction accomplished but not maintained:
After 2 years; 4 years; and 5 years (excision with good results).
Very marked improvement in motion and power from exercises in the two cases not excised.

Obstetric Palsy

Number of cases.....	13
Without posterior subluxation of shoulder	4
Perfect recovery of power and motion	2

Very slight and negligible limitation of motion at shoulder and old injury at elbow.....	1
Six months old and excellent promise of complete recovery of power and motion.....	1
With posterior subluxation of shoulder	9
Incomplete reduction (obstructing portion of acromion not recognized and removed).....	2
Complete reduction.....	2
Almost complete reduction.....	1
Mild subluxation not reduced.....	1

Excellent results in these six cases, varying largely with the degree of motion attained and, therefore, with the time since treatment began and completeness of reduction.	
Operative reduction of anterior luxation of head of radius; recurrence.....	1
No attempt at reduction of shoulder luxation and indifferent treatment.....	2

Brachial Paralysis with Flail Shoulder

Operative Removal of Relaxation:

Adults:

Complete recovery of motion and power.....	2
Left country early with stiffness of shoulder, but recovery of paralysis.....	1
Comminuted fracture of middle of humerus with improvement of paralysis, but non-union.....	1
Stiffness of all joints but recovery of paralysis.....	2

Children:

Encouraging improvement of paralysis, but far from satisfactory	4
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Miscellaneous Operations

Exposure of subacromial bursa	3
Exposure of greater tuberosity	4
Suppurative arthritis (axillary drainage).....	1
Second capsulorrhaphy for recurrent dislocation.....	1
Excision after capsulorrhaphy for recurrent dislocation..	1
Total number of operations on shoulder.....	49

I wish to acknowledge my indebtedness to the artist, Mr. Erwin F. Faber, of the University of Pennsylvania, for his assistance in the preparation of these diagrams.

2005 Chestnut Street.

ABSTRACT OF DISCUSSION

DR. ALFRED C. WOOD, Philadelphia: As opportunity is rarely afforded to examine a joint by dissection soon after an injury, our knowledge of the joint lesions due to traumatism is very imperfect.

We will be obliged, I believe, to change our views on some of the points that have hitherto been generally accepted concerning these lesions. The suggestion that the several fractures in the neighborhood of the shoulder-joint result from a common mechanism, is ingenious, and, I believe, is sound.

A prolonged or permanent disability of the shoulder after dislocation in certain cases is well known. In addition, however, a large number of cases are met in which a shoulder injury that appears to be relatively trivial is followed by quite as much impairment. These patients have been treated for chronic rheumatism, chronic arthritis, peri-arthritis, neuritis, etc. We are all familiar with the long and tedious course of these cases when subjected to the ordinary methods of treatment. The explanation just given offers a perfectly satisfactory theory which hitherto has been lacking. The capsule of the shoulder-joint being long enough to permit of a wide range of motion, some portion of it in most positions of the extremity, is relaxed or even thrown into folds. When the elbow is at the side of the chest, the upper surface of the capsule is tense and the axillary portion is lax. If there has been a rupture of this portion of the capsule and the arm is allowed to remain at the side during healing, the tear unites with the capsule more or less plicated and hence the latter becomes unduly shortened. In addition, the circumflex nerve may become involved in the scar. From one or both causes, but chiefly from the shortened capsule, there is greatly restricted motion at the shoulder-joint which it is sometimes difficult to restore to the normal range. To prevent the occurrence of this disability in cases of dislocation or when injury to the capsule is suspected, I have recently been advising that the humerus be kept in a position of partial abduction so that the axillary part of the capsule will be straightened out and smooth instead of lying in folds. If properly carried out I believe this will overcome the restriction of abduction so frequently seen. On the other hand, the abduction must not be sufficient to permit the head of the humerus to drop from the glenoid surface or to cause separation of the capsular tear.

DR. T. TURNER THOMAS, Philadelphia: I wish to confirm and, if possible, to emphasize Dr. Wood's statement.

In two cases of anterior dislocation of the shoulder associated with fracture of the surgical neck of the humerus,



Fig. 22.—Brachial paralysis of left side with flail shoulder joint following shoulder injury five years ago. Relaxation of upper and posterior portion of capsule and overlying rotator muscles overcome by operation, eight weeks after accident. Power and motion of limb practically normal about four months later and have remained so since. Some permanent atrophy of infrascapular muscles from operative shortening.

I observed his operations and I regard his results in these cases as important. We all know how difficult the reduction of the dislocation may be under such circumstances, with or without operation. In both cases he attempted reduction before operation without success and after freely exposing the head with the same result at this stage in both cases, he divided freely the tense, torn margin of the capsule which had been separated from the humeral attachment and had passed over and behind the head under much tension. To reenter the socket the head had to pass under that tense capsule edge, which was almost if not quite an insuperable obstruction. The free division of this portion of the capsule solved the difficulty and in both cases was followed by easy reduction. The principle is the same as that employed in the reduction by operation of those posterior dislocations at the metacarpophalangeal joint of the thumb which are irreducible without operation. Dr. Wood has shown that such devices as the McBurney hook for pulling the head into the socket, and excision of the head, are unnecessary in these troublesome cases.

A SUBSTITUTE FOR POTASSIUM PERMANGANATE TO LIBERATE FORMALDEHYD GAS FROM A WATER SOLUTION

SAMUEL G. DIXON, M.D., LL.D.

Commissioner of Health, Commonwealth of Pennsylvania

HARRISBURG, PA.

Almost immediately after the declaration of war by Germany I requested the department's chemist, Mr. Charles Lawall, to proceed at once to find a substitute for potassium permanganate that would liberate formaldehyd gas from a water solution for the purpose of disinfecting.

In the literature no mention of any other specific substance was found except in an English patent application (4885, J. S. C. I., 1908, page 915), where a combination of sodium bisulphite and formaldehyd solution was acted on by potassium permanganate or other peracid salt and the dry fumigation formula:

Formaldehyd, 37 per cent. solution..... 2 parts
Saturated alum sulphate solution..... 1 part

Eight ounces of this solution are used to 1 pound of lime to 1,000 cubic feet.

Dr. George Rosengarten suggested sodium dichromate as a cheap oxidizing agent, and hydrochloric acid to increase its energy. Lawall found on experimenting that sodium dichromate was more energetic and satisfactory in the presence of sulphuric acid.

Numerous experiments, confirmed by calculations on the relative oxidizing power of potassium permanganate and sodium dichromate, and also working out the optimum proportion of sulphuric acid, led to the conclusion that the following proportion gave the best results, which are in every way comparable to those with potassium permanganate:

Sodium dichromate 10 ounces avoirdupois.
Saturated solution of formaldehyd gas 1 pint.
Sulphuric acid, commercial, 1½ fluidounces.

The sulphuric acid and formaldehyd gas form a stable solution. This after it cools should be poured over the crystals of sodium dichromate spread out in a thin layer over the bottom of a vessel having ten times the capacity of the volume of ingredients used.

It was found that the process was more rapid than with potassium permanganate. This would necessi-

tate the health officer's withdrawing promptly from a room in which the process had been started.

Lawall, when working on a small scale, found in every case a corrosive residue. Much to his surprise the residue in ten minutes was dry and pulverulent, and a galvanized bucket which had been used showed very little effect of the reaction after washing out with soap and water.

He made a quantitative determination by both the permanganate and dichromate methods to determine the amount of volatile material given off and found that in each case it approximated 8 ounces avoirdupois (or about half the weight of the formaldehyd solution taken).

As formaldehyd solution contains between 35 and 40 per cent. of gaseous HCOH and as the residue in each case was found to be dry and particularly devoid of odor after two hours' standing, Lawall concluded that the two methods are equally effective from the quantitative standpoint.

Formaldehyd solution and commercial sulphuric acid may be kept in stock and shipped in the mixed form (10 parts of formaldehyd solution and 1 part sulphuric acid, both by volume). Lawall found the solution would be perfectly stable.

The solution would have to be handled with more care than the plain formaldehyd on account of the acid making it slightly corrosive.

Extensive Scalp and Brain Wound.—J. P., aged 28, American, while working in a planing mill, crawled under the table of a rip-saw to adjust a set-screw. Apparently forgetting the location of the saw, he raised his head, striking the saw which was making 2,500 revolutions per minute. The saw literally split his head open from well down on the forehead diagonally across the head, a distance of 8 inches, cutting through the scalp, bone, superior longitudinal sinus, membranes of the brain, and considerable brain tissue. The patient walked about one hundred yards when he collapsed. The hemorrhage was terrific. The width of the cut was one-fourth inch. I saw the patient about four or five minutes after the injury, and controlled the hemorrhage temporarily by a sterile gauze pack extending well down through the bone. The patient was then removed to a quiet room at a hotel, no hospital being available. With the assistance of Dr. J. F. Abel, I shaved the scalp, washed the head, removed the one large piece of gauze, and replaced four pieces of iodoform gauze packing, which controlled the hemorrhage and drained the wound. The scalp wound was then closed between the gauze packs with sutures. The patient was kept quiet for four days when he was removed to the Mission Hospital, Asheville, N. C., and treated by Dr. M. H. Fletcher, who removed the gauze packs and gave the wound the necessary attention. Considerable brain tissue oozed from the wound while at the hospital. The patient made an uninterrupted recovery and left the hospital the fifth week. He suffered very little during the whole time of confinement, and showed no signs of paralysis or any bad after-effects. He returned to work the eighth week after the injury.



Patient with extensive scalp injury after recovery.

SAM L. STRINGFIELD, M.D., Sunburst, N. C.

FOREIGN BODIES IN STOMACH

REPORT OF AN UNUSUAL CASE

J. LEWIS DAY, M.D.

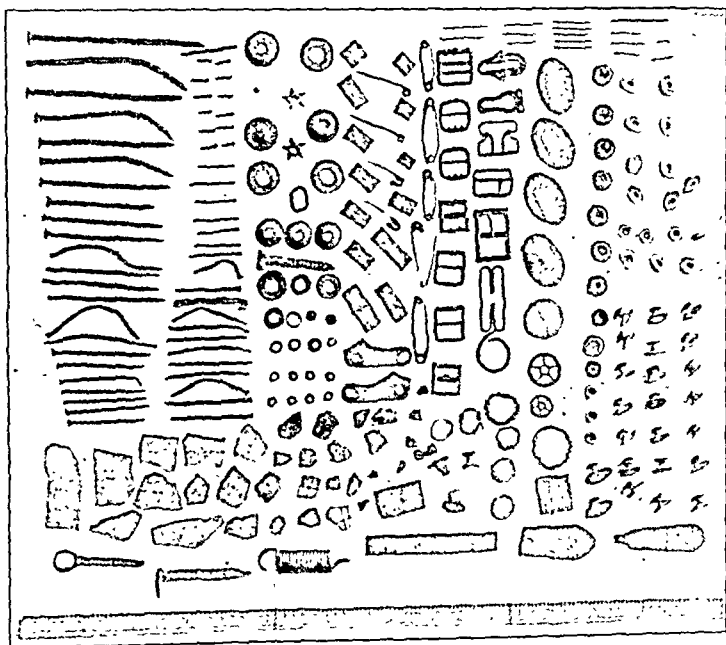
Assistant Physician, Oklahoma Hospital for the Insane

NORMAN, OKLA.

Many cases of swallowing of foreign bodies, especially among the insane, have been reported, but I have failed to find a case in which so large a number of articles were found in one stomach.¹

History.—The patient, M. M., colored man, aged 27, was admitted to the hospital July 9, 1911, for manic depressive insanity. He was born in Mississippi, was illiterate, and had spent one year in Tennessee State Hospital. The physical condition was good.

The patient's history in our hospital was uneventful. He was noted for his robust physique and irritable temper, was violent and frequently engaged in fights with other patients and his attendants. At no time was he discovered picking up nails or glass, or swallowing these substances; consequently he must have used a great deal of cunning in accomplishing his purpose. He had never been reported sick until



Foreign bodies found in stomach at necropsy of insane patient.

June 12, 1914, when he complained of dyspnea and abdominal pain. Physical examination at this time revealed marked edema of lower extremities, and ascites. The heart and lungs were normal, urinalysis negative, temperature 98.4, pulse 80, respiration 18. Subjective symptoms were indefinite pain and tenderness in abdomen. After a few days of rest in bed with appropriate diet and good elimination, all symptoms improved, but a moderate amount of ascites remained; there was no indication of intestinal obstruction. There was some dyspnea, but the chief complaint was pain in the abdomen. On account of the patient's mental state it was impossible to obtain reliable subjective symptoms.

June 18, 8 a. m., the temperature was 98, pulse 100, respiration 20. Patient had lost in weight and strength and looked sick but sat up in bed, drank his milk with relish at noon, and asked for meat. He died at 4:15 p. m.

Necropsy Report.—Mulatto, medium height, well nourished, with moderate abdominal distention. Lungs were adherent practically over entire surface to thoracic walls and pericardium. There were no tuberculous lesions. There was extensive anthracosis. Heart was of normal size, with no valvular lesion, and no sclerosis of aorta or other arteries.

About 2 liters of straw-colored ascitic fluid were taken from abdominal cavity. The intestines were not markedly abnormal; some adhesions were found about the appendix. The omentum was diminished in size, congested and adherent to stomach, was displaced backward and below the stomach, almost in relation with the posterior abdominal wall. The liver was small, surface smooth, gall-bladder filled, but normal; kidneys normal in size and consistency. Pyloric end of the stomach was displaced upward, backward and to the right, lying under the right lobe of the liver. Cardiac end normally placed, distended with gas. Stomach was removed and 236 separate articles weighing, net, 1 pound 9 ounces were removed (see illustration). The walls of the cardiac end of the stomach were not abnormal. Pyloric end was very much thickened and thickly studded with numerous villiform overgrowths. The foreign bodies were practically all collected in the pyloric end, many being embedded in the stomach walls. Pylorus was patent. No undigested food remained in stomach. Esophagus was not abnormal. Stomach contents and walls of pyloric end were blackened, apparently from action of iron. There was no evidence of recent or remote perforations of stomach walls, unless the abnormally adherent omentum might indicate former perforation.

It was evident that many articles had been in the stomach for a matter of perhaps years. Some of the pieces were never known at our hospital; hence the patient must have brought them with him nearly three years before. The fact that such things could remain in the stomach for so long a time and yet patient go about his duties, eat well, remain well nourished and do, whenever called on, heavy manual labor, should be of interest. As short a time as two weeks before his death he carried 100-pound sacks of flour from trucks to the store-room. We are inclined to think that pins, nails or other large objects and especially glass, when swallowed, may mean death or at least alarming symptoms; but this case shows that an abundance of hardware may be ingested and yet the patient live for months and years, with no apparent distress.

ADDENDUM

[A number of cases are on record in which a considerable number of articles were found in the stomach which had carried them, in some cases for years; without showing signs of serious injury. Perhaps the most remarkable are those in which pieces of broken glass with sharp angles are tolerated by the gastric mucous membrane without perforation resulting. Meisenbach¹ extracted a large number of articles including an ounce of broken glass (electric light globe) from the stomach of a professional glass-eater who styled himself "the Human Ostrich." W. S. Halsted² reports a case in which he extracted from the stomach of a professional glass eater 74 gm. of broken glass and 208 articles, consisting of 28 pieces of chain, 99 nails and 81 screws, knives, tacks, pins, etc. G. F. Inch³ reported a similar case. A. H. Vandivert and H. P. Mills⁴ report finding at necropsy of an insane patient, an amount of miscellaneous articles numbering 1,446 and weighing 2,268 gm. There were no signs of trouble with the stomach, digestion being good until a few days before death. These cases show the importance of a Roentgen-ray examination in such obscure conditions. In each instance such an examination would no doubt have revealed the source of the trouble.]

2. Halsted, W. S.: Contributions to the Science of Medicine, the Johns Hopkins Press, 1900, p. 1047.

3. Inch, G. F.: Am. Med., April 12, 1902, p. 603.

4. Vandivert, A. H., and Mills, H. P.: Foreign Material in the Stomach, THE JOURNAL A. M. A., Jan. 21, 1911, p. 180.

1. Meisenbach, A. H.: Gastrotomy for the Removal of Foreign Bodies in the Stomach, THE JOURNAL A. M. A., March 5, 1898, p. 513.

FRACTURE OF THE FEMUR INTO AN ACTIVELY TUBERCULOUS KNEE-JOINT

WITH HEALING OF THE FRACTURE

CHARLES A. PARKER, M.D.
CHICAGO

The following case recently under the care of Dr. Ridlon and myself appears to be of sufficient clinical importance to merit recording:

History.—The patient is a man aged 26, who has suffered more or less continuously from trouble in his right knee since he was 6 years old. It had been pronounced tuberculous. During the last two years he experienced a severe recrudescence of the trouble. In October, 1912, he fell on the knee and a diagnosis of fracture was made by the attending surgeon, and various treatments of the fracture and of the joint were carried out.

He came to our office March 18, 1913, wearing a cast and with a discharging sinus over the inner aspect of the knee. The knee was straight, swollen and had slight motion in flexion. There was more lateral motion and the joint was very sensitive. A roentgenogram was taken and a cast applied.

Figure 1 shows the type and extent of the fracture as well as the amount of destruction in the joint.

It is a typical supracondylar fracture of the femur with a vertical fracture through the external condyle down into the joint, and an oblique fracture extending 2 or 3 inches up into the shaft of the femur.

Whether or not there were more vertical clefts originally present, it is impossible to say from the picture. The picture shows some evidence of callus formation on either side of the femur overlapping the transverse fracture and a large posterior shadow that looks like callus, but without definite outline. The joint surfaces show a typical tuberculous picture. On account of the extreme tenderness of the part no attempt was made to determine the character of the union of the fracture; but the character of the joint and the age

parts through a stab wound in the posterior flap. Healing was prompt and uneventful.

The Specimen.—The soft tissues were removed from the specimen and the bone examined. Incidentally it may be noted that the region back of the joint, that is so definitely defined in the roentgenogram and appears as a deposit of lime-salts, showed nothing abnormal to the naked eye, although it was believed that a slight grating on the knife could be detected on scraping the cut surface. It consisted mostly of the popliteal fat in which there were no doubt calcareous elements, but not arranged so as to form any definite calcareous structure. The callus seen on either side of the femur in the roentgenogram was very slight and soft, but the

union of all the parts of the lower end of the femur was so firm that no movement whatever could be detected in them on testing the strength in our hands; in fact, there was a definite firm bony union with good position and in the presence of an actively tuberculous joint (Fig. 2). A histologic study of the tissue taken from the region of the posterior shadow failed to show any lime deposits or other conditions that might produce such a shadow. An excess of lime-salt may have been present, but not in a form recognizable by histologic methods.

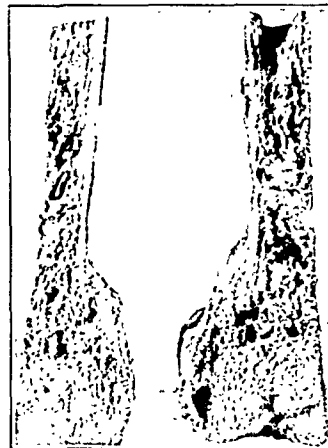


Fig. 2.—Section of lower end of femur in Figure 1, showing union of fragments.

Of course one instance is hardly sufficient on which to base a rule of practice, but it is the best evidence of what has occurred and in so much may influence us as to what may occur again. In other words, a fracture into an actively tuberculous joint can heal in a satisfactory manner, leaving only the original joint trouble for treatment according to the usual methods pursued in such troubles. Possibly another case may not progress so favorably as this case as far as the fracture is concerned, but this case certainly justifies us in expecting the bony union and a final healing of the joint in those cases in which the conservative healing of the joint is ordinarily indicated.

Another fact that should be emphasized in this connection is the presence of a shadow strongly suggestive of callus in a region in which operation demonstrates no callus to be present; or, in other words, what appears to be an insurmountable obstruction to flexion is in reality no obstruction at all.

7 West Madison Street.

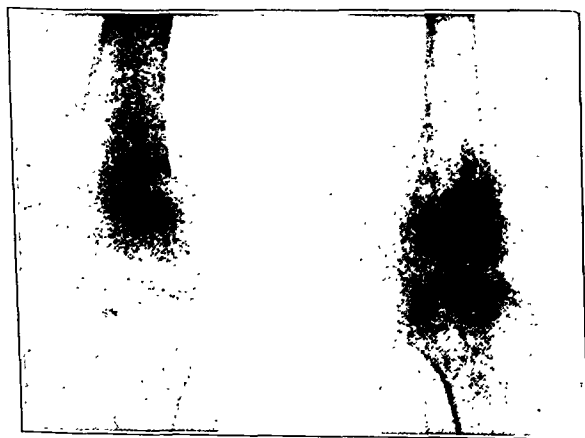


Fig. 1.—Roentgenogram showing fracture of the lower end of the femur extending into the actively tuberculous joint.

of the patient, together with his appearance of suffering from chronic sepsis, influenced us to suggest amputation of the thigh as the best solution of the problem. This was agreed on and the thigh was amputated just above the lower third, April 3, 1913. The operation was performed at the Presbyterian Hospital. A large tuberculous abscess was opened when the muscles of the front of the thigh were cut, four or five inches above the joint. Its walls were removed together with considerable sound tissue and the whole surface sponged with tincture of iodine and the wound entirely closed, a small gutta-percha drain extending into the deeper

The Value of a Pleasant Hospital Exterior.—In the description of a hospital a writer in *Country Life* says: "It is sometimes said that it is wrong to expend any money on the outside of a hospital, and that every halfpenny should be devoted to operating-tables and the like. This is surely a prejudiced idea. No building of a public sort should present a repellent front to the passerby; least of all, a hospital, which owes a smiling welcome to those who approach it with some sinking of heart. There are hospitals enough which suggest by their door faces, 'All hope abandon ye who enter here.' We need not be psychologists to recognize that none more than the sick need the subtle aid, not only of a happy environment within, but of the cheering welcome of an exterior that is homelike rather than 'institutional.'"

A CASE OF SPOROTRICHOSIS

L. A. DERMODY, M.D. AND C. McMARTIN, M.D., OMAHA

Mrs. G. G., aged 35, born and residing in Nebraska, with family and past history of no importance, noticed in November, 1913, what she termed a "red welt," pea-sized, oblong and painless, on the dorsolateral surface of the middle finger of the left hand. She can recall no trauma immediately preceding the lesion or at any time previous.

In from four to seven days after the appearance of the "welt," suppuration took place. The pus had no unusual color. One week later the patient noticed a red line extending up the extensor surface of the forearm as far as the elbow. This red line remained one week, gradually faded, and along the exact course it had taken she noticed a number of nodules just beneath the skin, not painful, from the size of a large shot to that of a cherry. These nodules extended about half way up the arm above the elbow, following definitely the course of the superficial lymphatics. There were never more than twelve or thirteen nodules. At this time she consulted her local doctor (about three weeks after the appearance of the initial lesion on the finger). The nodules were gradually growing larger and assuming a purplish color, but were not painful, nor had they suppurated. The physician incised the lesion on the finger, evacuated some pus and applied a moist dressing. Three weeks of this treatment gave no benefit and the patient felt that she was growing worse.

She came to Omaha and on Dec. 26, 1913, the nodules were opened, curetted and cauterized with phenol (carbolic acid)



Sporotrichosis lesions.

followed by alcohol. Temporary improvement took place, but at the end of two months the patient returned home with the areas of infection draining freely. Three months after this she returned with no improvement. No new nodules had developed.

At this time Dr. McMartin saw her and made a diagnosis of sporotrichosis. Cultures from the pus were made. A 2 per cent. glucose-agar showed at the end of five days a pure culture of sporotricha, spores predominating. A bouillon culture at the end of five days exhibited abundant growth, mycelium forms predominating.

April 16, 1914, the patient was anesthetized, and a number of curvilinear incisions made, each one exposing two or three of the nodules. These areas were thoroughly curetted, the skin undermined and the flaps stitched back, exposing the infected fields. One hour each day for three successive days the arm was exposed to the sun's rays. At the end of that time a healthy granulating surface had appeared and the flaps were loosened and sutured in place. The wounds were irrigated daily with 50 per cent. Lugol's solution until almost healed. A daily dressing of Lugol's solution was also applied. Increasing doses of potassium iodid were administered until 60 grains daily were being taken. At the end of six weeks the patient was allowed to return home with the arm entirely healed except for one small area which was rapidly closing.

Her report from the patient since leaving the hospital is that the arm is long since healed and is now perfectly

REPORT OF A CASE OF CEREBRAL HEMORRHAGE

WALTER W. MOTT, M.D., WHITE PLAINS, N. Y.

History.—The patient, a girl aged 3, had always been healthy. At 3 p. m., June 18, while playing, she accidentally stepped backward and fell down several steps, striking her head on a stone sidewalk, the exact manner of falling not being observed. She was able to stand up and walk, and after crying for a short time, she drank some water and went to sleep naturally. She awoke about 4:30 p. m., vomited several times, and appeared dazed. She did not recognize her mother. A slight twitching of her left arm was noticed. I first saw the patient at 5 p. m. The only evidence of external injury was a contusion over the right mastoid region. Pulse was 140, weak but regular. Respirations were irregular and shallow, seven or eight a minute. There was no bleeding from mouth, nose or ears. Pupils were equal, dilated and reacted sluggishly to light. There was no strabismus. By 5:30 p. m. the pulse was weaker and from 170 to 180 a minute. Respirations were even more shallow and irregular. There were convulsive movements of the left arm and leg, the eyes were turned to the right, and the pupils did not react. The lesion was evidently, therefore, an intracranial hemorrhage causing a rapidly increasing cerebral compression, with the focus of the damage over the motor cortex of the right hemisphere. Immediate operation was decided on, and the child was removed to the hospital, a short distance away.

Operation.—The head was shaved and tincture of iodine was applied over the right side. By this time no pulse could be detected at the wrist, the convulsive movements on the left side were almost continuous, and the respirations shallow and sighing. No anesthetic was given. A horseshoe incision was made in the scalp over the right temporal region, and a flap turned down. A trephine opening was then made in the skull over the site of the middle meningeal artery. On removing the button of bone, this artery was found intact. The dura bulged slightly, was blue, and did not pulsate. A small incision in the exposed dura showed oozing from beneath the posterior edge. The trephine opening was enlarged posteriorly with rongeur forceps, and the incision in the dura extended in the same direction. This exposed the site of hemorrhage, a rupture in the ascending frontal branch of the middle cerebral artery. As soon as the subdural pressure was relieved, the twitching of arm and leg ceased, the respirations became regular, and the radial pulse became palpable. The hemorrhage was profuse, and persisted in spite of gentle pressure with gauze. The lesion was given better exposure by a short incision in the dura bisecting the original line, and ligatures of fine plain gut on a round curved needle were passed beneath the artery on either side of the rupture, and tied. These controlled the hemorrhage perfectly. A narrow gauze wick was then carried down to the ligated artery, and the other end brought out through a stab in the flap. The dura was closed about the drain with sutures of fine plain gut, and the scalp and pericranium closed with interrupted sutures of silkworm-gut. The patient was awake and crying when the scalp sutures were inserted.

Postoperative Course.—The patient made an uneventful recovery. The drain and sutures were removed on the fifth day, the wound healing cleanly. She left the hospital on the tenth day, and since then has been perfectly well.

SUMMARY

1. The case was one of rapidly advancing cerebral compression, caused by hemorrhage from a branch of the middle cerebral artery.

2. The distinct "free interval" after the injury, and the later rapid increase in the severity of the symptoms, distinguished the condition from one of cerebral concussion.

3. The injury to the artery was caused by indirect violence, the blow on the head apparently being sustained over the right mastoid region.

4. The convulsive movements on the left side of the body pointed to a lesion involving the motor cortex of the right hemisphere.

New Instruments and Suggestions

A RECORD CARD FOR THE ANESTHETIST

PALUEL J. FLAGG, M.D., NEW YORK

Instructor in Anesthesia, Fordham University Medical School

Those who administer anesthetics sooner or later find it essential to preserve a fairly comprehensive record of each case. This becomes necessary not alone from a scientific point of view, but also for self protection.

NAME	DATE OF OPERATIONS	NO.
AGE	SEX	ADDRESS
NAME AND ADDRESS OF NURSE		
OPERATIONS		
SURGEON		ASSISTANTS
UNCONSCIOUSNESS AFTER OPERATION 10 min.		PREVIOUSLY ANAESTHETIZED 1 H ₂ O
CONDITION OF EYES AFTER OPERATION OK		CHAR. OF INDUCTION <i>Exh. Moderate</i>
F. TEETH <i>124</i> CHANCRS, RIGIDITY, JACITATION, MUCOS, VOMITING BEFORE, DURING, AFTER		
ANAE. SUCCESS <i>S. OK P. OK A. OK</i>		
REMARKS		
CHAR. JES:	BILL BENT	PAID.

Fig. 1.—Front of anesthesia record card.

System Anaesthesia	<i>Close Open</i>						
Apparatus Used	<i>3 bags</i>						
N ₂ O ₂	<i>3 oz 2 oz</i>				<i>5 oz</i>		
ETHER	<i>3 oz 2 oz</i>						
CHLOROFORM	<i>1/4, 1/100 at</i>		<i>10-15 AM.</i>				
M & A.	<i>1/4, 1/100 at</i>		<i>10-15 AM.</i>				
OXYGEN							
Stimulants							
Respiration	<i>f o f f f f</i>						
C. REFLEX	<i>s d a d s</i>						
PUPIL	<i>d c c c c d</i>						
PULSE CURVE DURING ANAESTHESIA	180	BEFORE ANAESTHESIA	ANAESTHESIA BEGUN	1ST HR. 20 40 60	2ND HR. 20 40 60	3RD HR. 20 40 60	CONSCIOUSNESS RETURNED
	170	A.M. P.M.	A.M. P.M.				
	160						
	150						
	140						
	130						
	120						
	110						
	100						
	90						
80							
70	<i>10.30</i>	<i>10.40</i>					<i>1.50</i>
60							
TOTAL TIME OPERATION		<i>1.50</i>	ANAESTHESIA		<i>2.00</i>		
ANAESTHESIA BEFORE OPERATION		<i>.10</i>					

Fig. 2.—Reverse of anesthesia record card.

It is frequently inconvenient to gather personal data at the time of the operation. To avoid this embarrassment a record card and a self-addressed, stamped envelope may be left with the nurse, who is usually glad to secure the desired information. The accompanying figures illustrate such a card.

The front of the card (Fig. 1) requires but little comment. Char. of Induction:—Excitement absent, moderate, marked. Anaes. Success:—S.—Point of view of the surgeon; P.—of patient; A.—of Anesthetist.

Heads for data which are absent should be crossed out. On the reverse of the card (Fig. 2) attention may be directed to the following points:

System of Anesthesia: Open, closed, pharyngeal, intra-tracheal, intravenous, rectal, etc.

M. & A.: Morphine and atropine.

Respiration: free, obstructed.

C. Reflex: sharp, dull, absent.

Pupil: normal, contracted, dilated.

Most records are squared off for five-minute pulse-readings. To save space twenty-minute divisions are here used. Five-minute readings may be shown by a dot one-fourth way across the space. These cards may be had from the Surgical Narcosis Supply Co., 13 East Fourteenth Street, New York City.

This record is original only in its arrangement. I wish to express my thanks to Dr. E. M. Hawks and Dr. F. Montgomery for their kind suggestions.

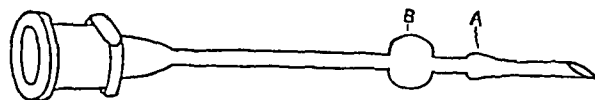
120 Central Park South.

A SELF-RETAINING NEEDLE FOR ADMINISTERING SALVARSAN INTRAVENOUSLY

HENRY EICHEL, M.D., NEW YORK

Those of us who have been giving salvarsan or other closed venous infusions have each developed a preference for a certain needle, which seems to us best fitted for the work in hand. Some of us swear by the straight needle, others are partial to the curved or one of the many modifications of either, and in all cases the esteem in which we hold our special form of needle is the result of the ease with which we seem able to manipulate it.

Not many physicians can give 120 to 200 c.c. of solution by gravity without experiencing a feeling of impatience at having to hold the needle in a fixed position in fear of its slipping out of the vein. And even when employing the



Self-retaining straight needle; A, conical or retention bulb; B, back-stop.

latest syringe method, in coupling and applying pressure to the piston, we are still obsessed with the constant fear of dislocating the needle point from the lumen of the vein and getting an infiltration into the adjacent tissues. This uncertainty and its consequent complications can be obviated by the use of a self-retaining needle. The object of this paper is to describe the principle on which any of the existing needles may be modified and made self-retaining.

DESCRIPTION OF NEEDLE

On an ordinary needle about one-quarter to five-sixteenths of an inch from the base of the cutting edge is a conical bulb beginning flush with the sides of the needle, becoming larger gradually till its diameter is about one and one-half times that of the needle and its length is one-eighth of an inch. This might be called the "retention-bulb" (A in illustration). A larger globular-shaped bulb, about four times the needle's diameter is placed about one-eighth of an inch distant toward the coupling end. The shape of this "back stop" is of little importance (B in illustration).

My own preference is for the straight needle, and I shall therefore describe my method of operation with this improved needle. I puncture the skin and enter the vein, pushing the needle in as far as the "retention bulb," then make a half turn of the needle on its long axis and push to bury the bulb. The bulb becomes firmly fixed in the skin and the needle becomes stationary and practically immovable. This method of fixing the needle may be compared to the venous infusion cannula in which the dilatation is tied within the vein. Here, however, the skin being elastic permits the entrance of the retention-bulb, which is firmly grasped, but does not enter the vein.

I prefer the straight needle because I like to feel that the possibility of puncturing the posterior wall of the vein is at a minimum, and turning the needle, which you can do only with a straight one, accomplishes this end. When the needle point is presenting in the vein, by turning it, the point, being eccentric, is shifted from the line of punc-

ture and puts the cutting edge of the needle parallel to the vein's posterior wall, thus lessening the possibility of passing beyond the venous wall when the retention bulb is pushed under the skin.

CONCLUSIONS

This self-retaining principle, therefore, has the following advantages:

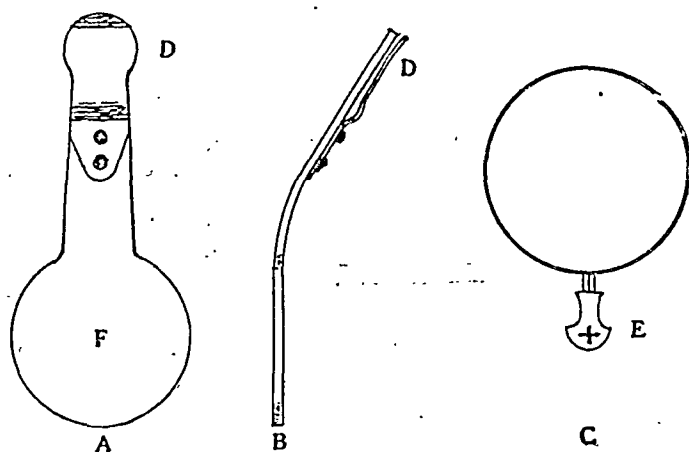
1. It may be applied to any needle.
2. It minimizes the nervous tension on the part of the operator due to the necessity of holding a needle immovable in one position for a tediously long time.
3. The needle cannot be dislocated while it is being coupled to the syringe.
4. Pressure applied to the piston will not dislodge the needle-point.
5. By freeing the hand that would ordinarily be fixed in holding the needle, one may even dispense with the services of an assistant.

54 West One Hundred and Nineteenth Street.

A HANDY MOUTH-FINGER

EDWARD M. MIKKELSEN, M.D., Winnetka, Ill.

It is always difficult, in examining or removing foreign bodies from an eye, to hold the lids apart, focus the condenser, and manipulate a spud or other instrument, all with the fingers of two hands. This led me to devise the little instrument shown in the accompanying illustration.



A handy mouth-finger.

To operate, place shank *E* of condenser under spring clip *D* of mouth-finger, swinging condenser either to right or left, depending on which eye is most convenient for work intended.

Place mouth-piece *F* of instrument between lips and under tongue, without applying teeth to it. The condenser should have a focus of about $2\frac{1}{2}$ inches, which is about 12 or 14 diopters. This gives a working distance between the eye and that of the patient of about 5 to 6 inches. Focus and distance takes care of itself automatically after one becomes accustomed to the instrument, leaving both hands free to do what is necessary.

The instrument is made of aluminum, which leaves no metallic taste in the mouth. The spring clip is made of German silver and the rivets of brass, all non-corrodable on boiling or washing. The instrument is light, fits the vest pocket without bulging, and is a companion piece to the condenser.

A SELF-RECORDING DEVICE FOR TESTING THE COLOR SENSE

J. ELLIS JENNINGS, M.D., St. Louis

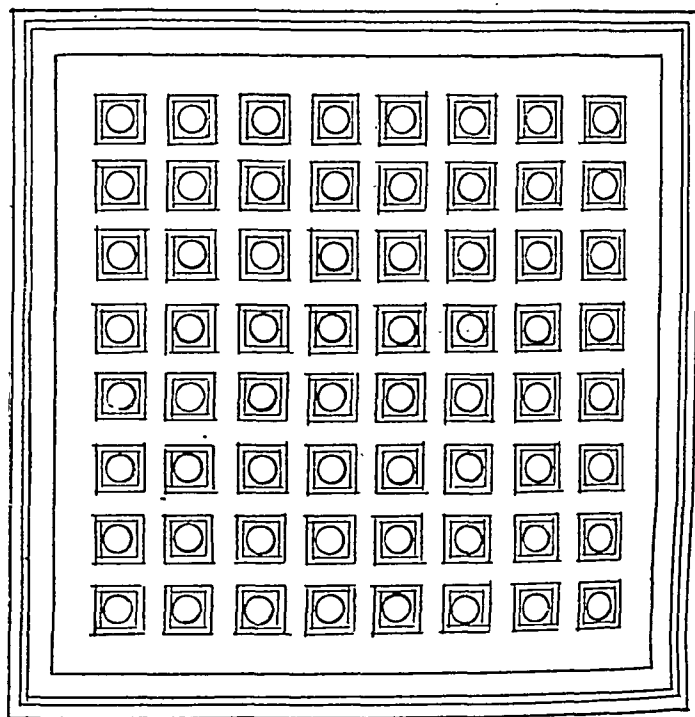
For many years the Holmgren colored worsteds have been used by the railways and marine service of the United States and most foreign countries to test the color sense of their employees. When properly used, according to directions, this test has proved to be practicable and reliable. The most serious objections to it are:

1. The worsteds become soiled by constant handling so that the more delicate shades can hardly be distinguished one from the other.

2. The method of recording the skeins selected by the candidate is crude, laborious and liable to lead to error.

In order to overcome these objections I have constructed a test in which the worsteds are not handled and the candidate makes a permanent record of his own color sense. It consists of a square box divided into an upper and a lower half, each half having a lid—virtually two shallow boxes with bottoms joined together. The upper side of the box is marked "Test No. 1 Green," and contains a color board made up of all the different colors, shades and tints likely to be mistaken by the color-blind for green. The lower side of the box is marked "Test No. 2 Rose," and contains a color board made up of all the different colors likely to be mistaken by the color-blind for rose. The color boards, like the box, are absolutely square and each contains sixty-four patches of worsteds of various colors and shades, making a total of 128 colors used in the test.

In each patch of colored worsted is a circular opening in the color board which is for the purpose of registering the particular patch of color chosen by the candidate. This he does by inserting a pointed pencil of wood or metal through the opening and punching a hole in the record sheet which had previously been placed beneath the color board. The position of the patches of color and the circular openings have been arranged in an absolutely symmetrical design, so



Jennings' self-recording color-test.

that when the box is turned in any one of four positions the same appearance is presented and it is impossible to say which is top or which is bottom. The openings of the color boards are so arranged that the records of both the green and rose tests are made on a single sheet.

METHOD OF MAKING THE TEST

The cover marked No. 1 is removed, the color board lifted out, a record blank inserted and the color board replaced. Care must be taken to see that the mark "top" in the box, "top" on the back of the color board and the top of the record blank all correspond. The box is now turned around several times until all sense of direction is lost.

The green test skein fastened to the inside of the box cover is placed at a distance of 2 feet and the candidate is given the pointed pencil and requested to look along each row of colored patches and when he sees the test color or one of its lighter or darker shades, he is to place the point of the pencil in the opening and punch a hole in the paper beneath. Having completed Test 1, the cover is replaced and the box turned over, exposing Test 2, the rose. The record blank having been inserted and the rose skein displayed, the test proceeds as before.

ADVANTAGES

1. The candidate makes a permanent record of his own color sense.
2. The soiling of the worsteds by constant handling is avoided.

3. The worsteds are divided into two groups: in the first group are placed all the colors mistaken for green by the color-blind; in the second group are placed all the colors mistaken for rose by the color-blind.

4. The comparison of colors by placing two or more together is avoided.

5. The large number of colors used, 128, gives free scope in the detection of all cases of color-blindness.

6. The small size of the color patches, while ample to show the color to the normal eyed, may lead to the detection of a central color scotoma.

7. The tedious method of recording the color sense by pulling out a concealed bangle and writing its number on a blank is avoided.

8. An important color cannot be lost.

9. On account of its symmetry it is absolutely impossible for any but those with a perfect color sense to pass the test.

10. It is the only method by which uniform results can be obtained whether the examination is made by the physician or by the layman.

11. Two or more records of the examination can be made at the same time and the official at headquarters is able to see exactly what colors have been selected to match the test skeins.

I am indebted to Dr. Charles H. Williams of Boston for suggesting the method of threading the worsted.

508 Carleton Building.

A NEW PETRI DISH COVER

C. C. YOUNG, M.S., Lawrence, Kan.

Director, Kansas State Water Survey

The ordinary porous Petri dish top has not given satisfaction in our water laboratory. In an attempt to eliminate the troubles a glaze was put on the outside of a few covers for experimental purposes. We were so pleased with the improved results obtained that hereafter porous tops with glazed outer surface will be used entirely in this laboratory.

These glazed covers combine the good features of both the glass and the ordinary porous tops. They are superior to the unglazed tops in many ways and the cost is no greater.

1. Evaporation of the water from the medium is reduced about 60 per cent., but they are still porous enough to absorb all water of condensation.

2. The glass bottoms are not scratched and ground when the plates are stacked in the incubator.

3. The glazed surface affords a convenient place for marking with a wax pencil. The marks can be rubbed off as easily as they can from glass.

4. The glaze adds much strength to the cover; consequently the breakage is reduced to a minimum.

5. They slip one over the other as easily as glass.

6. There is less danger of contamination, as the glaze protects the porous part of the cover so that material spilled on a plate is not absorbed.

The advantages of this new cover over the old appear to be sufficient to warrant all laboratories filling in their stock with this type.

UMBILICAL CORD OR FUNIS RETRACTOR

W. P. MEGRAIL, M.D., WHEELING, W. VA.

There is probably no more serious or fatal complication to the child during its birth than prolapse of the umbilical cord, which renders an otherwise easy and safe birth one of greatest danger to the life of the babe.

Also there is no other place in which the obstetrician finds himself so helpless to save the life of the child if unprepared for this complication when finding on examination a presenting, pulsating umbilical cord, and a half dilated rigid cervix.

There is usually no sterile catheter at hand, or if there is, it is difficult to thread it with a tape quickly and the babe is going to die in a few minutes unless the umbilical cord is promptly placed where it will be out of the way of the oncoming head.

This simple instrument is constructed of spring steel; 12 inches in length, 5/16 inch in width at the narrowest part, and about 1/60 inch thick except at both ends, where it is 1/8 inch thick, and rounded to prevent the danger of producing a puncture or laceration.

At one end there is a half circle crotch, 3/4 inch in diameter, containing a number of serrations on the inner circle so that it will hold the cord and carry it up into the uterus beyond danger of compression, or if the operator prefers he can use the other end of the instrument and thread it through one or both holes with a tape or strip of narrow bandage and pass it around the cord in the same manner as with the whalebone fillet or the modern catheter or bougie.

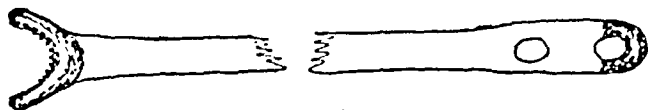
The advantages of this instrument are:

1. It can be perfectly and rapidly sterilized.

2. It is quick and easy of application.

3. It combines two instruments in one.

4. It is flexible and will adapt itself to any curve, and yet it occupies less space in the pelvis than a catheter.



Umbilical cord retractor

5. It is inexpensive, light in weight and occupies no space in the obstetric bag, where some appliance should always be found ready for this emergency.

6. It may also be used with advantage in passing a tape around a foot or leg in doing an internal version.

SELF-RETAINING COLLAPSIBLE T-SHAPED CATHETER FOR SUPRAPUBIC DRAINAGE OF THE URINARY BLADDER

W. L. CHAPMAN, M.D., PROVIDENCE, R.I.

Surgeon and Pathologist to St. Joseph's Hospital

At the left of the illustration the catheter is shown folded pencilwise in the grasp of an ordinary dressing or dissecting forceps ready to be introduced into the suprapubic incision.

When the forceps is withdrawn the catheter immediately springs into position with but slight adjustment. Withdrawal is easy on account of the soft material of the catheter. At A and B are shown the oval apertures for drainage which may be readily enlarged with the scissors if desired. In case larger drainage openings are needed the ends of the T arm may be snipped off. The catheter is practical, does not readily become clogged, allows but little leakage around it, may be removed or reinserted with but little pain to the patient, and may be used for prostatic as well as suprapubic drainage. It is made for me by the Davol Rubber Company of this city and may in a short time be obtained from dealers.

Self-retaining catheter for suprapubic drainage of the bladder.

254 Benefit Street.

Hydrobromid of Quinin in Whooping Cough.—I have had a pleasing experience in the use of neutral hydrobromid of quinin (gr. v four times a day in adults). It allays the spasmodic cough, relieves the sense of depression and conduces to rest. It seemed rational, that if it produces so happy an effect, as it often does in Grave's disease, it would be of service in whooping cough and it has proven so with me.—E. A. Hildreth, M.D., Wheeling, W. Va.

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SATURDAY, SEPTEMBER 19, 1914

RELATION OF VACCINE VIRUS TO POST-VACCINATION TETANUS

From time to time cases of tetanus following vaccination are being reported. These infections have been attributed to various causes; carelessness on the part of the operator, infection of the vaccination wound by uncleanly habits of the patient, a vaccine virus contaminated with tetanus, and, at times, a tetanus-infected wound of another part of the body received about the time of vaccination.

The Pennsylvania State Vaccination Commission¹ have reported on the relation of vaccine virus to tetanus following vaccination. They have given the subject much attention and some important facts have been determined. Of especial interest were the data with regard to the period of incubation and the case mortality of tetanus following vaccination, as compared with tetanus in general. It was shown before the commission that of 870 cases of tetanus studied by Anders and Morgan, the disease developed in 568 between the first and tenth days after infection. In 302 cases the incubation period was from ten to twenty days or more. Of the 568 cases with an incubation of ten days or less, 419 were fatal, giving a mortality of 73.8 per cent. Of the 302 cases with an incubation period of more than ten days, 45 patients died, a mortality rate of only 11.5 per cent.

The significance of these figures, in their bearing on vaccinal tetanus, is at once obvious. The great majority of cases of vaccinal tetanus have an incubation period of over two weeks, counted from the date of vaccination, while the fatality of vaccinal tetanus is 78 per cent., as shown by Wilson's² 52 cases. This closely corresponds with the mortality of 73.8 per cent. found by Anders and Morgan for tetanus with an incubation period of less than ten days, and hence lends much weight to the assumption that cases of vaccinal tetanus contract their infection subsequent to vaccination and not from the vaccine virus.

These data and the inferences drawn therefrom, however, while extremely suggestive, are not convinc-

ing unless supported by other data, such as laboratory experiments. These latter, up to the present, have been lacking in a measure. In a recent bulletin of the Hygienic Laboratory, however, Francis² reports the results of extensive laboratory studies on tetanus, especial attention being given to the relation of vaccine virus to tetanus.

Under the Federal law regulating the manufacture and interstate sale of viruses, serums, etc., it has become necessary to examine a large number of samples of vaccine virus. Since the law went into effect, in 1902, there have been examined in the Hygienic Laboratory over 1,500,000 doses of vaccine virus with especial reference to the presence of tetanus spores. In not a single instance has the tetanus bacillus or its spore been found in vaccine virus.

In many instances, samples of vaccine virus of the same lot as that used in cases of vaccinal tetanus have been examined, but the result was negative for the presence of the tetanus organism. For this reason, and to be sure of his materials, Francis resorted to artificial contamination of vaccine, in order to carry out his experiments. He discusses well-known difficulties encountered in growing tetanus bacilli from vaccine virus, and shows that no single cultural method or animal test will invariably detect the presence of tetanus, but that a combination of different methods is effective.

A number of attempts were made to infect monkeys with tetanus by vaccinating them with a virus which had been heavily contaminated artificially with tetanus spores, but in no instance did the animal develop tetanus, although typical takes were produced. From these experiments it would appear that even if virus contains tetanus organisms, it is improbable that infection with tetanus will follow. The great importance of guarding the vaccination site from contamination cannot, therefore, be too greatly emphasized. Interesting information is given with regard to the results of cleanliness in collecting vaccine virus from a calf that had been vaccinated with virus artificially contaminated with tetanus spores. After carefully washing one portion of the vaccinated area with sterile water and brush, the virus was collected under aseptic conditions from the washed area and also from the unwashed part. The virus from the unwashed area showed, when examined culturally, tetanus in 100 per cent. of the cultures, while cultures from the washed area gave only 22 per cent.

If washing the vesiculated skin of the calf's abdomen with sterile water is sufficient to remove 75 per cent. of the tetanus spores artificially implanted thereon, it would certainly seem that before vaccinating, we should be able to remove 100 per cent. of tetanus spores from the smooth skin of the arm, should

1. Report of the Pennsylvania State Vaccination Commission, March, 1913.

2. Francis, Edward: Laboratory Studies on Tetanus, Bull. Hyg. Lab., 95, August, 1914.

they chance to be present. With a tetanus-free virus and a tetanus-free site for vaccination, and with reasonable after-care, there should be no vaccinal tetanus.

In spite of the evidence submitted by Francis, we should not neglect rigid asepsis in performing vaccinations in the belief that the vaccination sore will not absorb tetanus infection. His work should serve as a warning to us not to be too ready to put blame on the virus, the operator or the patient if we should be so unfortunate as to have a case of tetanus following vaccination. To put the blame in the wrong place does not alleviate the suffering of the patient or relatives in the least. It does allow a case to go into medical history which leaves the true avenue of tetanus infection unsuspected, to cause perhaps a repetition in another case at some future time.

Most of the accidents associated with vaccination can be attributed to the failure on the part of the physician or patient to realize that vaccination is a surgical operation and that the vaccine wound is a wound that must receive the same care and asepsis that any other operation wound should receive.

THE ADJUSTMENT OF THE DIETARY TO ECONOMIC CONDITIONS

The migration of a large fraction of the population of the civilized parts of the world from the country to the cities is one of the phenomena attending the "industrialization" of modern nations. Whereas formerly the city was essentially a center for trade and office life, of late the factory with its large working population has become an adjunct of city life. From the point of view of nutrition, which plays a dominant part in determining the fitness of the individual for work, it is unfortunate that the less opulent laboring classes should be drawn away from the region of cheap food in the country to homes where new standards of living are imposed on them. The altered distribution of the population has brought with it certain problems of nutrition that cannot be dismissed as inconsequential or solved by restrictive legislation. Economic laws sometimes are far more effective than educational propagandas or governmental interference.

The industrial worker who migrates from the country to the city, like the immigrant, soon finds that he must alter his accustomed diet. The simplicity of an adequate diet obtainable in the country regions cannot readily be continued in the city. The cheapest articles of food, such as bread and potatoes, available in the larger centers, do not satisfy the protein requirements sufficiently as a rule. But even if cheap forms of protein were procurable, the demand for a special source, namely, meat, soon becomes a dominating factor in the selection of the ration. Meats, whether of mammals, birds or fishes, have always

entered prominently into the dietary of the well-to-do; and in this country, where the tendency to wipe out the distinctions between social classes is always in operation, the poor and the less favored groups are continually striving to imitate the ways of their more fortunate neighbors. A national sentiment fosters this ambition in a country where "every man is a king." The urban workman wants good cuts of meat not because they are absolutely indispensable to health, but because the example of his neighbor has encouraged the habit. It is quite different on our farms and in rural communities, where local produce enters more largely into the home.

With an impending rise in price and increasing scarcity of meat making itself felt throughout the country, and with the growing tendency of the industrial workers coming from the country to the cities to try to provide the table which is demanded by their well-to-do neighbors, a household problem inevitably arises. Either the dietary habit must be materially changed to include a different type of ration—a scheme almost impossible of accomplishment where food customs are in part dictated by usage—or retrenchment in expenditures must be sought in some other way.

At present the cheapest articles of food include potatoes, peas and beans, and certain cereals in the form of coarse bread; cabbage forms a cheap green vegetable; among animal products, milk and cheese are comparatively inexpensive; fish furnish the cheapest forms of flesh foods; and dried apples are among the cheapest fruits. Expensive butter can be in part replaced advantageously by less expensive, yet thoroughly wholesome animal and vegetable fats. Beef, which is always expensive, might well be replaced more liberally by fish than it has been in the past. Without having statistics at hand to support the statement we nevertheless venture the opinion that the popularity of fish is growing rapidly in America. Potatoes are not yet competing with the cereals as extensively as they might well do; but cheese is likely, as we have intimated before,¹ to find increasing favor.

The adequate dietary is a decidedly flexible affair, and it is well that this fact should become widely inculcated. The idea that even radical departures from acquired food habits are likely to lead to nutritive disorder and decreased efficiency needs to be eradicated. The foods of nations vary widely and yet support creditable human specimens. When once this fact is thoroughly appreciated there will be less dismay when a rise in the price of some supposedly indispensable product is announced. The adjustment of the dietary to the pocketbook will be further facilitated when intelligent marketing becomes recognized as a household art that deserves cultivation.

1. Cheese—a Neglected Nutrient, editorial, *THE JOURNAL A. M. A.*, April 6, 1912, p. 1016.

SODIUM VERSUS POTASSIUM COMPOUNDS

The beds of potassium salts in Stassfurt and other localities in Germany have been shut off from commerce by the war, and we are threatened with a shortage of potassium salts. As the supply of sodium salts is practically inexhaustible in this country, why should we not prescribe them? While many of us in prescribing the bromid have fallen into the habit of prescribing potassium bromid, we know of no reason why sodium bromid would not be just as good, at least in practically all cases.

Though it may be difficult to get out of the habit of prescribing potassium iodid, it is doubtful whether it is any more effective than sodium iodid. Sodium acetate could easily be substituted for the potassium acetate. The potassium salts are slightly more stable than the sodium salts, but in general the salts of the one base have no marked therapeutic advantage over the corresponding salts of the other. The potassium compounds are more active and are said to possess a more marked diuretic effect; but the sodium salts are less depressing to the heart and in some instances less disagreeable to the taste.

In this matter we have to consider the therapeutic effect, the side effects and the pharmaceutical reasons for preference of one salt over the other. In the case of the bromids and the iodids the therapeutic effect is derived from the negative element; that is, iodine or bromine. This being the case, it is a matter of indifference whether we use potassium bromid or sodium bromid, or whether we substitute sodium iodid for potassium iodid, except that the relative amount of iodine and bromine is a little greater in the sodium compounds than in the potassium. With regard to side effects, sodium compounds are thought to be less irritating to the stomach, and in large doses potassium bromid or iodid might be somewhat more depressing to the heart. With regard to physical properties, sodium iodid and bromid are less permanent in the air, but this concerns the pharmacist more than the physician, as these salts should be prescribed in solution.

Potassium acetate and citrate are used as diuretics, but can be conveniently replaced by sodium salts, as the therapeutic aim is reached just as well by prescribing sodium citrate or acetate as by the use of the corresponding potassium salts. Here there appears to be no difference on account of side actions or of physical properties.

It seems possible that the vogue of the potassium compounds has a historical cause, and is at present due largely to habit. The earliest source of sodium carbonate, from which most of the other sodium salts are derived, was the ashes of seaweeds; the earliest source of potassium carbonate was wood ashes. Wood ashes were plentiful and cheap, inland as well as on the seacoast; hence the natural preference for potas-

sium compounds. It is of interest now to recall that the first impetus to the general employment of sodium salts was given by another devastating war. During the French revolution the important soap industry in France was seriously crippled because all the available potash in France was required for gunpowder, and the importation of soda-ash made from kelp and wrack was suspended. A prize offered by the Directory for the best method of producing sodium carbonate from sodium chlorid was won in 1794 by Le Blanc. The sodium carbonate produced by his process, however, was not cheap enough to withstand the competition of the Spanish kelp-ash, which was imported into France as soon as commercial relations with other countries were reestablished, and the unfortunate Le Blanc died by his own hand in a poorhouse. The value of one of its by-products, hydrochloric acid, saved the Le Blanc process from extinction, and it is still extensively used in Great Britain; but the price of sodium carbonate did not become reduced to anything like its present level until the Solvay process came into general use in the latter part of the nineteenth century.

How much effect, if any, these commercial factors have had on the therapeutic use of potassium compounds is not easy to prove. It seems probable, however, that the original high cost of sodium carbonate, the source of most other sodium compounds, has not been without influence on pharmacy. The pressure of necessity caused by the present war probably will have the effect of rationalizing this branch of our therapeutics. The sodium salts, being less irritating than those of potassium, will be given the preference except in cases in which the latter are specifically indicated.

INDUSTRIAL HEALTH

The importance of the problem of industrial sanitation is gradually becoming more fully realized. Some employers, indeed, even yet apparently take the ground that, if workmen are willing to labor under insanitary conditions, it is no concern of their employers. The New York State Factory Investigating Commission, which has carefully studied the conditions under which about two hundred thousand wage-earners work, reports that "there is a tendency on the part of many employers to economize not only in matters of legitimate expense but also in space, light, air, and certain other safeguards to the health and lives of the workers." The report of the State Board of Health of Louisiana indicates that over 50 per cent. of all the manufacturing establishments in the state are in "poor" or "bad" sanitary conditions. Most states have no available figures, but New York and Louisiana are so far from each other geographically, economically and socially, that, for lack of better, we may take these two reports as an index of industrial health conditions generally throughout the United States. On the whole,

however, we believe that with each year employers tend to appreciate more and more the commercial value to them of sanitary working conditions for their employees.

B. S. Warren of the United States Public Health Service, who has been deputed as sanitary adviser to the United States Commission on Industrial Relations, points out¹ that the false economy involved in neglect of sanitation inevitably leads to greatly lessened efficiency and is thus really expensive for the employer in the end. The highest efficiency is possible only when the health of workers is favored by good air and light, proper arrangement of hours of labor and the maintenance of the safeguards of health.

With regard to hours of labor particularly, some recent experience is valuable as indicating that shortened hours of labor may actually conduce not only to the health of employees but also to greater production. In the Engis Zinc Works the hours of labor were cut down from twelve to eight per day, yet the men earned as much and did as much work in eight hours as they did formerly in twelve. Besides there was a marked decrease in the calls on the sick fund, the men no longer felt the need of stimulation, and sobriety was markedly increased. Almost the same thing happened at the Zeiss Optical Works in Germany. Abbe kept a careful record for the years when the plant was operating on a nine-hour day. When the working day was reduced to eight hours, the record showed the men earned over 3 per cent. more than during the previous year, the output of the work was increased 3 per cent. and the power-plant was able to shut down an hour earlier, thus effecting a very material saving in fundamental expense. The record was for 233 men at an average age of 31 years, and many different occupations on a piece-work basis were represented in the shop.

Both employers and employees need to be convinced of the evident fact that the healthy man is the most efficient and the cheapest employee and that any reasonable expense to maintain him in health is a profitable investment. The public health worker can act as a mediator between capital and labor and aid greatly in the amicable adjustment of the prevalent industrial strife. Warren suggests that it is regrettable that medical men have neglected so long to teach methods of disease prevention. "Their study must include the total environment and, if possible, untangle the bundle of influences that in effect are producing disease more surely than the germs which are the direct agents." Physicians as impartial investigators can present the facts and suggest the remedies to both sides and thereby accomplish great good for social improvement and public health.

METABOLISM IN FEVER

The construction of the ideal dietary schedule for fever patients will not be accomplished until the nature of the disturbance of metabolism in diseases attended with rise of body temperature is clearly ascertained. It is agreed that the increase in total metabolism in fever is ordinarily associated with increases in protein metabolism. The cause of the latter, however, has given rise to much speculation and contradictory views. At least three explanations of the higher catabolism of protein have been ventured. First, it has been ascribed to the high temperature. We have previously referred to the investigations of Graham and Poulton¹ on this point. Living on a ration abundant in carbohydrates whereby they easily reached a low plane of nitrogenous equilibrium, these investigators subjected themselves to heated steam sufficient to raise their body temperature to as high as 40 C. (104 F.). During this artificial state of high temperature no alteration whatever in protein metabolism was noted; therefore the physical factor of rise in body temperature cannot be postulated as the primary cause of the considerable and constant augmented destruction of protein noted in true clinical fevers.

As a second cause of the increased protein metabolism noted in fevers an alleged condition of undernourishment of the body cells has been postulated, an impoverishment of the store of glycogen in particular being held responsible. It is, of course, a well-known fact that lack of carbohydrate occasions increased destruction of protein in the organism under any condition. It was the distinct merit of Shaffer and Coleman in this country to have attempted to forestall the depletion of the non-protein energy reserve of the body in typhoid fever by instituting their now widely known high-calorie feeding in this disease.² With a diet abundant in carbohydrate and fat it was shown that, even with a low protein intake, patients may be maintained in almost complete nitrogenous equilibrium throughout the duration of the typhoid infection. The brilliant results achieved raise the question whether the success is due to the provision for a compensatory regeneration in the organism or to a prevention of what may here be referred to as the third possible cause of protein catabolism in fever, namely, destruction of protein by the action of the special toxins produced.

Dr. Rudolph A. Kocher³ of Baltimore, working in Friedrich Müller's clinic at the University of Munich, has questioned the interpretation of the results of Shaffer and Coleman. He notes that the excellent

1. Graham and Poulton: *Quart. Jour. Med.*, October, 1912, p. 8. Metabolism in Fever, editorial: *THE JOURNAL*, A. M. A., Dec. 7, 1912, p. 2070.

2. Shaffer, Philip A.: Metabolism in Typhoid Fever, *THE JOURNAL* A. M. A., Sept. 19, 1908, p. 974; Shaffer, Philip A., and Coleman, Warren: Protein Metabolism in Typhoid Fever, *Arch. Int. Med.*, Dec. 15, 1908, p. 538. The Utilization of the High-Calorie Diet in Typhoid Fever, editorial, *THE JOURNAL* A. M. A., Oct. 12, 1912, p. 1378.

3. Kocher, R. A.: Ueber die Grösse des Eiweisszerfalls bei Fieber und bei Arbeitsleistung. Untersuchungen mittels des Stickstoffminimums, *Deutsch. Arch. f. klin. Med.*, 1914, cxv, 82.

1. Warren, B. S.: Industrial Conditions, Their Relation to the Public Health, *Pub. Health Rep.*, May 29, 1914, p. 1348. Paper read before the Health Officers' Conference of the State of Louisiana.

protein-sparing results achieved by their high carbohydrate diets were as a rule not attained until the fever had progressed into the second or third week of the disease. It is quite conceivable, as Kocher maintains, that the favorable effect does not manifest itself until after the first or severe stage of the infection; that is, until a period when the organism has acquired ability to resist the deleterious consequences of the noxious agencies. Accordingly Kocher has reinvestigated the protein metabolism in the earlier stages of febrile disease. He reports that even very liberal diets yielding as much as 80 calories per kilogram cannot retard the protein catabolism in the early period of the fevers as they do later. The conclusion is therefore forced on Kocher that, contrary to some of the more recent contentions of other clinical students of metabolism in fever, a considerable destruction of protein not chargeable to the high temperature *per se* or to insufficient energy intake, actually takes place. In the words of Kocher, infectious fever must be pictured as a clinical syndrome of rise in temperature and protein destruction, the latter perhaps due to special (toxic) effects on the protoplasm. It should be clearly noted that this conclusion in no way contra-indicates the essential changes in the dietary that have found their way into practice in this country, especially in the management of typhoid fever. More liberal feeding in suitable cases has come to stay. It merely brings the question of the quota of protein desired into the foreground once more.

THE ABSOLUTE AND PERCENTILE AMOUNTS OF SUGAR IN THE BLOOD

In the chemical pathology of sugar metabolism, there are numerous anomalies which have long been confusing because of their apparently conflicting character. The hyperglycemia of the typical diabetic individual may be regarded as an undisputed fact. There are, however, cases of glycosuria in which the percentage of sugar in the blood is certainly not increased above the normal. It is these which have furnished the basis for the claims of a form of renal diabetes in which the chief distinguishing characteristic appears to be an increased permeability of the kidney for blood-sugar.¹

To help explain the presence in certain individuals of glycosuria without hyperglycemia, and, conversely, the absence of glycosuria when hyperglycemia is present, Epstein and Baehr² have offered a new hypothesis, based on a series of experiments in the Pathological Laboratory of the Mount Sinai Hospital in New York City. Their observations on the hyperglycemia following hemorrhage lend themselves to a new interpretation. It has long been known that after removal

of blood the concentration of sugar in the circulating fluid subsequently increases. Some investigators incline to attribute the resulting hyperglycemia to psychic causes. It is doubtless true that an increased percentage of sugar results from the manipulation and operative interference—an increase probably associated with the adrenal disturbances to which we have referred editorially in the past.³ Very marked hyperglycemias following blood-letting doubtless involve such factors. But it is quite possible to obtain smaller increases in the percentage of sugar even when the psychic disturbances are avoided. Epstein and Baehr have now pointed out that the increase in the percentage of sugar in the blood is indicative only of a relative, that is to say, percentile, but not an absolute, hyperglycemia. Although the percentage concentration rises after bleeding, the total amount of sugar present in the circulation, calculated on the assumed blood-volume, remains surprisingly constant. For example, in one animal, the total blood-volume before the bleeding was computed at 105 c.c. (5 per cent. of the body-weight). The amount of blood drawn was 30 c.c.; in other words, 75 c.c. of blood was left in circulation. The percentage of sugar in the blood as drawn was 0.105 per cent.; two hours after the bleeding the sugar-content rose to 0.154 per cent. By comparing the total volumes of blood in the animal before and after the bleeding, they are seen to bear the ratio to one another approximately as 3:2. On the other hand, the percentages of sugar in the blood before and after the bleeding are to one another as 2:3. In other words, the percentage of sugar in the blood is inversely proportional to the blood volume.

The increase in the percentage of sugar in such experiments with hemorrhage is usually seen to bear a striking relationship to the proportion of blood left in circulation after the bleeding. To test the hypothesis regarding the constancy of the absolute amount of blood-sugar, Epstein and Baehr also replaced the blood withdrawn by an equal quantity of physiologic saline solution. Under these conditions no change in the percentage concentration of the sugar occurs; for in most cases the sugar concentration of the diluted blood rapidly rises to what it was before the hemorrhage. In other words, the total sugar in the circulation remains unchanged.

Commenting on the cases of so-called renal glycosuria, the New York investigators remark that these may be dependent on an increase in the total blood-sugar and that the absence of any hyperglycemia could be accounted for by the existence in these individuals of an abnormally large blood-volume. They suggest the advisability of studying blood-volumes and computing therefrom the total blood-sugar in cases of diabetes mellitus. It seems somewhat far-fetched to

1. Renal Diabetes, editorial, THE JOURNAL A. M. A., Nov. 1, 1913, p. 1632.

2. Epstein, Albert A., and Baehr, G.: Certain New Principles Concerning the Mechanism of Hyperglycemia and Glycosuria, Jour. Biol. Chem., 1914, xviii, 21.

3. Newer Views of the Functions of the Adrenals, editorial, THE JOURNAL A. M. A., July 25, 1914, p. 322.

conclude, as Epstein and Baehr propose, that in such studies may lie the explanation for the disproportion which occurs so frequently in this condition between the degree of hyperglycemia and the intensity of the glycosuria. It is not easy to understand how any tissue-cells can distinguish or appreciate the total amount of circulating sugar, whereas it is quite in line with other chemical experience to find modifications in physiologic reaction induced by altered concentration of components of the blood. The fact of the apparent normal constancy of the absolute quantity of circulating sugar in individuals is of interest, whatever the validity of the appended theory may be.

Current Comment

SCIENTIFIC MEDICINE IS "PRACTICAL" MEDICINE

A letter received by THE JOURNAL reads: "What is the best treatment for diabetes mellitus?" That is all. There is nothing unique about the letter or the question; it is a sample of queries that come every few days, and illustrates the fact that some men are still treating names. There is a popular notion that a definite treatment has been laid down to correspond to every disease name and that having learned the name of the disease, one has but to apply the treatment prescribed in the text-book. The idea is crude and fallacious that when the diagnosis is made, the treatment is easy, the fallacy arising from the fact that diagnostic analysis is not carried far enough and names alone suffice without a determination of the pathologic condition in all its details. Our present querist appears satisfied with the name "diabetes," qualified, to be sure, by the adjective "mellitus." A little reflection should indicate that this name includes a number of different conditions, the presence or absence of which must decide the plan of treatment to be adopted. Thus diabetic patients differ much in their tolerance of carbohydrates. Some have acidosis and are threatened with coma, others are in no immediate danger. Before deciding on the treatment for any disease the actual conditions requiring relief must be determined, and then the appropriate remedy prescribed. In the case of diabetes it must be determined to what extent carbohydrates can be tolerated by the individual patient, as there may be present so great a degree of acidosis that to exclude carbohydrates would be dangerous. If the danger is from intoxication by sugar in the blood, the diet must be regulated to reduce the sugar to a minimum. If acidosis threatens, the proper remedies must be chosen to avert the danger. We are taking this particular letter and the disease it specifies to emphasize a principle; for the principle applies to other diseases—to all diseases, in fact. There is no specific treatment for typhoid fever; even the diet of a typhoid patient must vary according to conditions. The same is true of pneumonia: what will benefit one pneumonia patient may injure another. Those who conduct the so-called "practical journals," and more particularly the readers

of these journals who love so-called "practical matter," should note that more is required of the physician than a diagnosis of the disease by name only. If it were otherwise doctors would not be necessary, for the majority of people can tell a case of whooping-cough, of measles, of typhoid fever, and of other common diseases. The people would need merely to look in a book and see the treatment. The doctor is supposed to treat, not a name, but the individual patient and the particular conditions in that patient. There is no "best treatment for diabetes," but what is best for each patient must be settled first by determining the actual pathologic conditions in the individual affected.

NEW FACTS ABOUT THE CEREBROSPINAL FLUID

There has taken place of late a commendable revival of interest in the normal and morbid physiology of the cerebrospinal fluid. A superabundance, rather than a diminution, of this fluid is the predominant factor in every morbid process of the central nervous system in which it is affected. In hydrocephalus, congenital and acquired, and in the various forms of meningitis, the excessive accumulation of fluid not only plays a part in the clinical expression, but also is often the determining factor in the high mortality-rate of these diseases. That there must be a disturbance of the balance between secretion and absorption to account for the abnormal increase is self-evident, but which of the two factors is the more potential has been a matter of conjecture. As a contribution to this problem, the work of Dandy and Blackfan¹ is significant. They were able to demonstrate by the production of an artificial hydrocephalus, not only that practically all the fluid was generated within the ventricles, but also that there was no absorption within the ventricles. Furthermore, by the injection of phenolsulphonophthalein, these observers were able to establish a normal standard for the excretion of phenolsulphonophthalein after its injection into the ventricles or subarachnoid space, and have further used the phenolsulphonophthalein test to distinguish clinically between two forms of hydrocephalus, one with, and the other without, obstruction to the ventricles. In a similar series of experiments Frazier was able to demonstrate by the phenolsulphonophthalein test that the venous channels play the most important part in absorption, and that the lymphatic absorption is a negligible factor. When the phenolsulphonophthalein was injected into the ventricle, the dye-impregnated cerebrospinal fluid appeared in the torcular herophili in two minutes, whereas it took almost twelve hours for it to reach the lymph-nodes of the parotid group when injected into the subarachnoid space. Of the earlier contributions, the most important by far were those of Faivre, Luschka, Francini, Levaditi and Mott, who by histologic evidence have shown that the cerebrospinal fluid is a secretory product of the choroid plexus, or as Mott describes it, the "chorioid gland"

1. Dandy, W. E., and Blackfan, K. D.: An Experimental and Clinical Study of Internal Hydrocephalus, THE JOURNAL A. M. A., Dec. 21, 1913, p. 2216.

with an external secretion and an internal destination. Dixon and Halliburton² and Frazier³ have been conducting independently a series of experiments in their laboratories on the hypothesis that inasmuch as the choroid plexus is a gland with a secretion, its function might be increased or decreased by certain influences. Dixon and Halliburton found that the injection of brain extract and more particularly the extract of choroid gland caused a hypersecretion, attributed to the specific action of some substance—possibly a hormone product of brain metabolism—on the secretory cells of the choroid gland. Of greater significance is the finding by Frazier of a substance which has a distinctly inhibitory effect. In marked contradistinction to all other glandular extracts, the extract of the thyroid gland was unique in that it caused a continued and prolonged decrease in the flow of cerebrospinal fluid, wholly irrespective of the effect on blood-pressure. It is often a far cry between laboratory demonstration and clinical application, but these experiments offer a hope of dealing with the problem of perverted secretion at its source. This, it seems, is the significant feature of these researches.

ONCE MORE THE LEAGUE FOR MEDICAL FREEDOM

The National League for Medical Freedom has again exercised its divine right of protesting against anything and everything beneficial to the public health. As those familiar with the history of the League know, protesting is one of the best things it does. Readers of *THE JOURNAL* may recall the first appearance in the public eye of this organization which suddenly burst, meteor-like, on the public, through the medium of half and full page display advertisements in the leading newspapers of the country, setting forth the awful dangers and deep laid plots of "The Medical Trust." Incidentally, as nearly as can be estimated, this campaign, costing about \$50,000, was inaugurated before the newly organized "League" had any membership that any one had ever heard of. Just where the money came from to finance such an extensive campaign has never been explained. For several months during the summer and fall of 1910, the "League" protested to its heart's content, after which (whether due to exhaustion of its funds or of its lungs, it is impossible to say) it lapsed into the condition immortalized by Grover Cleveland as "innocuous desuetude." It has not been heard of since except that in a few localities where particularly ardent disciples dwelt and kept the fire burning on the altar, it has intermittently lifted up its voice in protest against everything in the way of sanitary progress and disease prevention, claiming in all cases that the efforts of physicians to diminish disease are a diabolical and deep laid scheme on the part of the "medical trust" to secure complete control of the nation. Just why the "medical trust" should want control or what it would do after it got it, the League has never divulged

any more than it has its proof of the existence of such a "medical trust." These things are locked deep in the bosoms of the devoted partisans who make up this organization. The latest protest on the part of the League is directed against the United States Bureau of Education. In the report of the Commissioner of Education for 1913, in a series of twenty-five or thirty papers by experts on the progress of education in different fields, appears an able summary of the progress in medical education, by the secretary of the Council on Medical Education of the American Medical Association. This Council, it is hardly necessary to state, has for eight years past carried on an extensive study of medical education in this country. It appears that about the time this report was being prepared, an Iowa member of the National League for Medical Freedom wrote a paper objecting to the medical inspection of schoolchildren, which was sent to the Commissioners of Education with the demand that it be printed as a part of the Bureau of Education publications. The United States Commissioner of Education, it seems, declined to publish the article, wherein the National League for Medical Freedom sees evidence of a dark and awful conspiracy between the American Medical Association and the United States Government, and proceeds to protest. Of course, there may be such a plot, although the evidence on this point seems to be conspicuously lacking; but one explanation for the action of the Bureau of Education has apparently not occurred to the National League for Medical Freedom. It is barely possible that the reason why the report on medical education was gladly accepted and the tirade on medical inspection of schools was declined was that the report was the result of eight years of careful study, while the "protest" was the usual jumble of vague charges, exaggerated statements and unsupported assertions. In a word, it is barely possible that the Bureau of Education acted as it did because one paper was worth publishing and the other was not. This explanation has evidently not occurred to the National League for Medical Freedom, and simple as is this explanation, it is hardly to be expected that it would.

THE WINE OF CARDUI LIBEL SUIT

In last week's issue, attention was called to the fact that the manufacturers of "Wine of Cardui" have filed suit against the American Medical Association and the editor of *THE JOURNAL*. The Chattanooga newspapers, in noting the fact, state that the Chattanooga Medicine Company has engaged a firm of attorneys in Chattanooga, another attorney in Knoxville, still another in St. Louis and a fourth in Chicago, giving the names in each case. Such wholesale retaining of lawyers as that described probably comes high, but doubtless the Chattanooga Medicine Company can afford it. Defrauding the sick has in the past been an easy road to wealth, although we venture to prophesy that it is likely to be less easy in the future. The Wine of Cardui concern hires the lawyers, but the ailing women of the country pay the bill.

2. Dixon and Halliburton: *Jour. Physiol.*, 1914, xlviii, Nos. 2 and 3.

3. Frazier, Charles H.: *The Cerebrospinal Fluid as a Problem in Intracranial Surgery*, *THE JOURNAL A. M. A.*, July 25, 1914, p. 287.

Medical News

ILLINOIS

Teachers Must Be Examined.—The Board of Education of Springfield stated that all teachers in public schools must undergo physical examination and obtain certificates of health before being allowed to take positions.

Chicago

Faculty Changes.—Dr. Daniel A. K. Steele has been appointed senior dean and head of the department of surgery in the College of Medicine of the University of Illinois; Dr. Charles Spencer Williamson, professor of medicine and head of the department; Dr. Charles Sumner Bacon, professor of obstetrics and head of the department of obstetrics and gynecology; Dr. Julius Hays Hess, associate professor of pediatrics and head of the division of pediatrics; Dr. Norval Pierce, professor of otology; Dr. Joseph C. Beck, associate professor of laryngology and rhinology and head of the division; Dr. Oscar Eugene Nadeau, instructor in surgical pathology; Dr. A. O. Shoklee, associate professor of pharmacology; Dr. Roy L. Moodie, instructor in anatomy and Dr. C. S. Smith, instructor in physiological chemistry.

INDIANA

State Society Meeting.—The annual meeting of the Indiana State Medical Association will be held in Lafayette, September 23 to 25.

Suit to Get Physician's Estate.—The suit for \$80,000 against the estate of the late Dr. Michael A. Jordan, Logansport, brought by John Jordan, Nolen, claiming to be the natural son of Dr. Jordan, is said to have been compromised for \$8,000.

Personal.—Dr. Brown S. McClintic, Peru, has received an appointment as surgeon under the American National Red Cross and will sail for Europe this week.—Dr. Andrew W. Smith, Hammond, has been appointed director of athletics in Throop College, Pasadena, Cal.—Dr. Charles Melvin Mix, Muncie, has returned from abroad.—Dr. James H. Walker, Henryville, has been appointed social superintendent of the Indiana State Reformatory, Jeffersonville, vice Prof. Rufus B. von Klein Smid, elected president of the University of Arizona.—Dr. W. N. Williamson, Indianapolis, has been appointed supreme medical examiner of the Order of Larks.

IOWA

Society Offers Service.—The Fort Madison Medical Society, at its meeting August 31, offered the services of its members free to the school board for the examination of school-children.

Demand for Small-Pox Pamphlet.—The State Board of Health of Iowa recently issued an edition of 42,000 copies of a bulletin regarding small-pox, and during the first week after the issue 37,000 copies were asked for.

Tuition Fees Not Raised.—An official statement from the State University of Iowa says that the tuition fees to both the College of Medicine and the Homeopathic College of Medicine for the four years, respectively, are \$60, \$50, \$50 and \$60. Reports previously sent in erroneously gave the figures as nearly twice those amounts which were published in the Educational Number of THE JOURNAL.

Personal.—Dr. Charles E. Glynn has been appointed president of the Davenport Hospital.—Dr. Vernon L. Treynor has been elected medical inspector of the Council Bluffs schools.—Dr. Percival B. Glew, Des Moines, has been appointed instructor in physical hygiene in the public schools of that city.—Drs. Mary K. Heard, Iowa City, and Louis G. Patty, Carroll, have returned from abroad.

KENTUCKY

Antityphoid Inoculation.—At the request of Senator James, Surgeon-General Rupert Blue, U. S. P. H. S., is forwarding a sufficient supply of antityphoid serum to Pineville for the inoculation of 400 persons. Typhoid fever is prevalent in camps around Pineville.

Personal.—Dr. Joseph N. McCormack, Bowling Green, who has been ill for several months, recently underwent an operation at Rochester. His many friends will be glad to know that he is doing well, and that the outlook is promising that he will soon be restored to health.

Campaign against Trachoma.—The recent government survey showed about 250 cases of trachoma in Jefferson County outside of Louisville, 75 per cent. being curable. Wide-spread infection is present also in Breathitt, Clay, Jackson, Lee, Leslie, Onsley, Perry and Clark counties, almost every county in Kentucky being more or less affected. The State Board of Health has accordingly prepared a proclamation excluding from the schools all children with trachoma until they have been treated and pronounced cured. In Louisville free treatment is to be given at the Emergency Hospital and free transportation will be afforded the patients to the hospital. Dr. Mullins of the U. S. Public Health Service will come to Louisville to take personal charge of the work. Each patient will be expected to remain in the hospital for a week or ten days, and the course of the case will be supervised by the physicians or a nurse for several weeks after the patient returns home. Teachers are to be instructed in the symptoms of trachoma and given authority to send home any child with suspicious sore eyes. The children will not be allowed to return until pronounced free from infection after medical examination.

LOUISIANA

Home from Abroad.—Dr. and Mrs. H. F. Ader and Drs. Robert C. Kemp and John A. Caruthers, Baton Rouge, have returned from Europe.

Dispensary Open.—It has been decided by the board of directors of the Sickles Fund for the Dispensing of Medicine to the Poor to open an additional dispensary at the Touro Infirmary, New Orleans.

Personal.—Dr. Frederick W. Parham has resigned from the Board of Administration of Tulane University of Louisiana, in order to accept the chair of surgery in the New Orleans Polyclinic for the coming session.—Dr. Edmund D. Martin has been appointed to the chair of gynecology in the New Orleans Polyclinic.

Maternity for Touro.—The Touro Infirmary, New Orleans, will build a maternity hospital through the beneficence of Mrs. Henry Newman, who has donated \$25,000 for the purpose. The building is to be known as the Henry Newman Maternity Hospital, as a memorial to the donor's late husband.

Medicine Practice Act.—At the recent assembly of the Louisiana State Legislature a very complete medical practice act was passed. One of the features embodied in the act is a physician for examination in the following branches: "Anatomy, physiology, chemistry, obstetrics, gynecology, physical diagnosis, surgery, pathology, materia medica, theory and practice of medicine and hygiene, providing that any person not using internal medication in his or her practice shall be exempt in examination in materia medica." In a concluding section there is a provision: "That nothing in this act shall be construed as applying to the practice of osteopathy or dentistry, or as effecting or changing existing laws on these subjects."

MARYLAND

Personal.—Drs. Charles W. Hartwig and Ridgely B. Warfield, Baltimore, have returned from abroad.—Dr. Louis A. Sexton, newly appointed admitting physician and third assistant superintendent of the Johns Hopkins Hospital, Baltimore, assumed his new duties September 11.

New Hospital Opened.—The Du Pont Maternity Hospital, erected at Cambridge, through the generosity of Mrs. Alfred I. Du Pont of Wilmington, Del., has been opened to the public, although the formal opening will not occur until later. The building has cost about \$35,000, the gift being made through Dr. Brice W. Goldsborough. It is a three-story brick building with concrete floors. It is erected near the Cambridge-Maryland Hospital, with which it is connected by an inclosed corridor. There are two wards with eight beds in each and nine private rooms.

Banner Centennial.—The following Baltimore physicians composed the Medical Relief Committee during the Star Spangled Banner Centennial, September 6 to 13, and rendered assistance to those who were injured or ill: Dr. George L. Wilkins, chairman, and Drs. John W. Chambers, Thomas R. Chambers, Thomas S. Cullen, Cecil W. Vest, William S. Baer, Alexius McGlannan, John D. Blake, Herbert C. Blake, George A. Hartman, Frank J. Kirby, Robert Parker Bay, Thomas J. O'Donnell, Joseph E. Gichner, John R. Abercrombie, Albert T. Chambers, G. C. Threine, Walter D. Wise, Archibald C. Harrison, D. Webster Cathell, John Staige

Davis, William T. Watson, George Heller, Archibald M. Shipley and Monroe A. Maas.

MASSACHUSETTS

Personal.—Dr. Vincent Y. Bowditch, Boston, is reported to be at Liverpool awaiting passage to the United States.—Dr. Edward P. Worth, Edgartown, has been appointed medical examiner for Dukes County.

Home from Europe.—Drs. Francis D. Donoghue, Boston; Rufus A. Kingman, Brookline; George B. Buehler, Cambridge; Dr. and Mrs. Edward F. Himmins, Boston, and Frank B. Granger, Boston, have returned from Europe.

Hospital Open.—The new St. Elizabeth's Hospital, Brighton, opened September 1. The building is fireproof, three stories in height, has been erected at a cost of a quarter of a million dollars and has accommodations for more than two hundred patients. Dr. John R. Slattery is superintendent of the institution.

MICHIGAN

Personal.—Dr. Emil Amberg, Detroit, and Collins H. Johnston, Grand Rapids, have returned from abroad.—Dr. Fritjof E. Berge, Grand Rapids, announces his intention of remaining in England for considerable time.

Board of Health Train.—The trip of the Michigan health train just finished is said to be the most successful expedition thus far undertaken. During the month, the train was exhibited to more than 40,000 people.

State Medical Society Meeting.—The forty-ninth annual meeting of the Michigan State Medical Society was held in Lansing, September 10 and 11, under the presidency of Dr. Guy L. Kiefer, Detroit. Grand Rapids was selected as the meeting place for 1915 and the following officers were elected: president, Dr. Reuben Peterson, Ann Arbor; vice-presidents, Drs. Louis W. Toles, Lansing; Alfred W. Hornbogen, Marquette; Colin D. Munro, Jackson, and Vernon A. Chapman, Muskegon; counselor for third district, Dr. Starr King Church, Marshall; delegates to the American Medical Association, Dr. Louis J. Hirschman, Detroit; and Herbert E. Randall, Flint; and alternates, Drs. Jacob D. Brook, Grandville, and Alford E. W. Yale, Pigeon.

MINNESOTA

Home from Abroad.—Dr. Muhlenberg Kellar Knauff, Two Harbors; Dr. and Mrs. Arthur T. Mann, Minneapolis, and Dr. Olaf J. Hagen, Moorhead, have returned from abroad.

Personal.—Dr. John E. Crewe is acting at present as health officer of Rochester.—A banquet was tendered Dr. William E. Harwood, Eveleth, by his professional associates of the Range Medical Association, at Hibbing, September 4. Dr. Harwood is about to move to Peoria.

Cancer Committee Named.—Drs. Warren A. Dennis, St. Paul; William J. Mayo, Rochester, and James E. Moore, Minneapolis, the committee on cancer of the Minnesota Public Health Association have been invited to act as the Minnesota State Committee on Cancer for the American Society for the Prevention and Control of Cancer.

Selection of Sanatorium Site.—At a meeting of the commissioners of the Southwestern Minnesota Antituberculosis Sanatorium Association which includes the counties of Lincoln, Lyon, Pipestone, Murray, Cottonwood, Rock, Nobles and Jackson, held in Windom recently, it was decided to name a first, second and third choice of sites, leaving the final selection to the State Board of Control. The first choice is that offered by Windom on Fish Lake, about 4 miles east of Windom, 54 acres in extent, at \$110 an acre; the Currie site of 123 acres is located 100 miles north of Currie on the shores of Lake Shetek and is offered at \$150 an acre, and the site offered by Worthington is 1½ miles south of that place on the shores of Lake Okebena and consists of 60 acres offered at \$150 an acre. It is proposed to construct buildings costing about \$100,000.—The Wabasha County Tuberculosis Commission has selected Wabasha as the site for the State Sanatorium.

NEW YORK

District Society Meeting.—The Eighth District Branch Medical Society will hold its annual meeting at Niagara Falls, September 23 and 24, under the presidency of Dr. Arthur A. Bennett.

Medical Club Organized.—The Miamonides Club, a private medical club recently organized in Buffalo, held its first meeting at the Hotel Statler, recently, under the presidency of Dr. Marcell Hartwig.

Mallein Test Required on Imported Horses.—Beginning September 1, this state will not permit any horses to enter its borders unaccompanied by a certificate of freedom from glanders, established by the mallein test.

Personal.—Drs. Lucien Howe and Ray Johnson, Buffalo, have returned from abroad.—Drs. Lester Levyn and Milton H. Goldberg, Buffalo, are reported to be still in the war zone in Europe.—Dr. Abraham S. Tepper, house surgeon at St. Joseph's Hospital, Far Rockaway, Long Island, was operated on for appendicitis in the hospital, September 1, and is reported to be doing well.—Dr. Harold K. Faber, Westfield, has accepted a position on the staff of the Rockefeller Institute for Medical Research in New York City.

Epidemic Sore Throat in Rockville Centre.—In Rockville Centre, a town of 4,250 inhabitants, during the first half of June over 200 cases of septic sore throat developed. About 90 per cent. of the sick were found to have used milk from a single dairy. Altogether about 400 quarts were delivered daily from the dairy to about 173 customers. A milk supply making up one-fourth of the total was shown to be in use in at least nine-tenths of the cases. Over 200 cases occurred among 173 customers and about one case is recorded for every 2 quarts of milk delivered.

New York City

Personal.—Dr. Walter Booth Adams, Beirut, Syria, is spending a furlough of eight months in the United States.—Dr. William H. Luckett and Dr. and Mrs. George A. Tuttle, and Dr. Jacob L. Maybaum have returned from Europe.

Typhoid Fever in Brooklyn.—Typhoid fever has developed in the Park Slope section of Brooklyn since September 1, and up to September 10, twenty-nine cases have been reported. Vigorous search is being made to find the source of the infection.

Health Department Official Dies.—Mr. Alfred T. Metcalf, for twenty-eight years connected with the Health Department of Brooklyn and recently chief clerk, died in his summer cottage at Sheepshead Bay, September 2, from cerebral hemorrhage, aged 61.

For a Health Home.—The bulk of the estate of Jacob Langeloth, estimated at more than \$10,000,000, has been bequeathed as a foundation for a home, to be known as the Valeria*Recreative and Convalescent Home. The institution is designed as a home for people of refinement and education who cannot afford to pay the charges exacted at health resorts. It is to be non-sectarian.

The Death-Rate of Children Under 5 Years of Age.—A recent *Bulletin* of the Health Department states that the question is often asked "Why do all organizations direct their efforts to saving babies under 1 year of age only to allow them to die during the second or third year?" The department has therefore made an investigation of the death-rates of children at the various age periods under 5 years. A comparison of the five-year period from 1904 to 1908, previous to the establishment of the Bureau of Child Hygiene, with the five-year period from 1909 to 1913, shows that there has been a decrease in the death-rate of 23 per cent. in children under 1 year of age, of 25 per cent. between 1 and 2 years, 27 per cent. between 2 and 5 years, and a total of 26 per cent. under 5 years of age.

OHIO

In the War Zone.—Dr. and Mrs. James G. Grant, Akron, are on their way home from Europe by way of Denmark.—Dr. Martin Stamm, Fremont, is reported to be serving with the hospital corps of the Swiss army in Berne.—Dr. Miloslav Francisci, Cleveland, has returned from Europe.

Toledo Will Grade Restaurants.—In future every restaurant in Toledo will be graded by the City Board of Health. Cleanliness, absence of odors, personal hygiene of employees and equipment of kitchen will be taken into consideration. Each restaurant will be given a card with its grade, "A," "B," "C," marked thereon. Those below "C" will be barred.

District Tuberculosis Hospital.—Ashtabula, Geauga, Lake and Trumbull counties have been placed in Tuberculosis Hospital District No. 4, by the Division of Tuberculosis of the State Board of Health. Under the amended district hospital law, passed last winter, the cost of the erection and maintenance

nance of the hospital is assessed against each county in direct proportion to its tax duplicate.

To Urge Health Laws.—Dr. Benjamin R. McClellan of Xenia will be chairman, and George V. Sheridan of Columbus, secretary, of a committee of the Ohio State Medical Association, Ohio State Board of Health, Ohio State Dental Association, Ohio Commission for the Blind and Ohio State Pharmaceutical Association, to urge various changes in, and additions to, the health laws at the next session of the legislature.

Conference on Public Health.—The Ohio State Medical Association, the Ohio Society for the Prevention of Tuberculosis and the State Board of Health were represented at a conference on public health held in Columbus September 3. The conference discussed suggested legislation dealing with the division of the state into health districts, strengthening the act under which the commission for the blind operates, and amendments to the tuberculosis law providing for easier entrance to the Mount Vernon Tuberculosis Sanatorium.

Cincinnati

Abroad and Returned from Abroad.—Drs. William C. Herman, J. Henry Schroeder and son, Julien E. Benjamin and John M. Withrow have returned from abroad.—Dr. and Mrs. Adolf F. Morgenstern are reported to be in Koenigsberg.—Dr. and Mrs. William Gillespie are waiting in Edinburgh for an opportunity to return to this country.

Personal.—Dr. E. Gustave Zinke has been appointed a member of the Municipal Board of Health in place of Dr. Edward W. Walker, term expired.—Dr. Charles F. Sanborn has resigned as superintendent of the Cincinnati City Hospital, to take effect November 1.—It is stated in the daily *Press* that Dr. Arthur C. Bachmeyer is to succeed Dr. Sanborn as superintendent and that Dr. Walter E. List, at present assistant superintendent at the hospital, will be appointed superintendent of the Branch Hospital in place of Dr. Bachmeyer.—Dr. U. G. Senour, Pleasant Ridge, has been appointed district physician for Kennedy Heights.

PENNSYLVANIA

New Medical Club House.—Plans have been completed for the new club house at Wilkes-Barre, for the Luzerne County Medical Society. It is to be of stone and brick, 48 by 65 feet, fireproof and will cost \$20,000.

New Buildings for State Hospital.—At a meeting of the trustees of Rittersville State Hospital, plans were adopted for the erection of a reception building, two buildings for tuberculosis patients and a nurses' home and an isolation cottage.

Personal.—Dr. Henry J. Benz has succeeded Dr. Henry B. Burns as superintendent of the Bureau of Child Welfare of the Department of Health of Pittsburgh.—Dr. Adolph Koenig, Pittsburgh, has been reappointed a member of the State Bureau of Medical Registration and Licensure.—Dr. W. D. De Long, Reading, and J. Clayton Weidman, Mercer, have been reappointed members of the State Dental Board.—Dr. Henry B. Burns, retired superintendent of the Child Welfare Bureau of the Pittsburgh Department of Health, was given a dinner by the employees of the Bureau, August 31, and was presented with a traveling bag. Dr. Burns began his work as head of the Medical Department of the Board of Education of Pittsburgh.

Philadelphia

Hospital News.—Charity Hospital announces, in addition to the Roentgen-ray room, the remodeling of operating-room and alterations in different parts of the building. Alterations and additions are to be made to the Rush Hospital for Consumptives.—Ground has been broken for a four-story addition, 44 by 36 feet, to the Kensington Hospital, at a cost of \$19,000.—In order that colored orphans and deficients may receive vocational training under the most favorable conditions and that colored convalescents may be guaranteed a restoration of health, the authorities of the Mercy Hospital are planning to remove their social service department to the country. So soon as a desirable farm site can be found in Philadelphia County, buildings will be erected for one of the most complete, scientifically equipped institutions conducted by colored people in the United States.

WISCONSIN

European Travelers.—Dr. Urban J. Durner, Milwaukee; Dr. Charles W. Giesen, Superior, and Dr. William Webber Kelly, Green Bay, have returned from abroad.

Personal.—Dr. William F. Lorenz of the staff of the Mendota State Hospital for the Insane has returned after a six months' trip of research in the South, devoted to the study of the causes and effects of pellagra.—Dr. R. Jay Elliott, National Home, has been elected surgeon-general of the United Spanish War Veterans.

State Hygienic Laboratory Enlarged.—The entire top floor of south hall in the University of Wisconsin, Madison, has been given up to the state laboratory of hygiene which is maintained out of university funds and is under the supervision of a special committee composed of Dr. Cornelius A. Harper and William F. Whyte, representing the State Board of Health, and president, C. R. VanHise and Prof. Charles R. Bardeen, dean of the medical school representing the university. The laboratory is under the immediate charge of Dr. W. D. Stovall, chief bacteriologist, and E. J. Tully, chief chemist.

GENERAL

District Society Announcement.—The Iowa and Illinois District Medical Association announces through its program committee that at the regular fall meeting to be held the first week in October in Davenport, Dr. William J. Mayo and his guests will address the society, and that at the meeting to be held October 23 in Rock Island, Ill., Dr. Albert J. Ochsner, Chicago, will be the guest of the society.

Railway Surgeons Convene.—At the annual meeting of the Minneapolis, St. Paul and Sault Ste. Marie Railway Surgical Association held in St. Paul last week, the following officers were elected: president, Dr. Alexander J. McCannel, Minot, N. Dak.; vice-president, Dr. John B. Darling, St. Paul; secretary-treasurer (ex officio), Dr. John H. Rishmiller, Minneapolis. Minneapolis was selected as the next place of meeting.

Conference on Tuberculosis.—The second Mississippi Valley Conference on Tuberculosis, in cooperation with the National Association for the Study and Prevention of Tuberculosis, will be held in St. Louis, October 6 to 8. This is the first of four sectional conferences being held on tuberculosis, the others being at Bangor, Maine, Philadelphia and Atlanta. For information write to Mr. W. A. Jones, Jr., Mississippi Valley Conference on Tuberculosis, St. Louis, Mo.

Cumberland Valley Physicians Meet.—At the annual meeting of the Cumberland Valley Medical Association held at Boiling Springs Park, September 3, the following officers were elected: president, Dr. Charles M. McLaughlin, Greencastle, Pa.; Drs. S. Seibert Davis, Boonesboro, Md.; Samuel E. Mowery, Mechanicsburg, Pa., and John W. Croft, Waynesboro, Pa.; secretary, Dr. John J. Coffman, Scotland, Pa. (reelected); treasurer, Dr. Paul P. Allen, Chambersburg, Pa.

Colored Practitioners' Meeting.—The Tristate Association of colored physicians, dentists and pharmacists of Ohio, Kentucky and Indiana met in Indianapolis, September 7 to 9, and perfected an organization and elected the following officers: president, Dr. William A. Method, Columbus, Ohio; vice-president, Dr. William J. Woodlin, Columbus, Ohio; secretary, Dr. Henry W. Armistead, Indianapolis, Ind.; treasurer, Dr. Abram L. Cabell, Terre Haute, Ind. The next meeting of the association will be held in Columbus, Ohio, in July next.

A Warning.—A subscriber writes that a certain Donald McCormick is soliciting subscriptions to a bureau called the "American Bureau (or Institute) of Medical Research," at Indianapolis, Ind. The purpose of this bureau, he states, is to receive all medical journals of the world and to make reprints of each individual article which are kept in stock and lent to subscribers to the bureau. The cost of membership is \$5 a year. A physician in Iowa who addressed the bureau had his inquiry returned with the announcement that no such institution existed, and that the addressee was not at the place named.

Bequests and Donations.—The following bequests and donations have recently been announced:

Mt. Sinai Hospital, German Hospital and Manhattan Eye and Ear Hospital, each \$5,000; the Isabella Heimath and St. John's Home, New York City, each \$1,000 by the will of Jacob Langeloth.

Mt. Sinai Hospital, Montefiore Home, Lebanon Hospital and Beth Israel Hospital, New York City, each \$5,000 by the will of Renno Neuberger.

Montefiore Home, New York City, \$2,500 for endowment of a bed in memory of his parents, by the will of Albert Rich.

German Hospital, New York City, \$1,000 by the will of Adam Schulz.

St. Vincent's Hospital, New York City, \$2,307, the proceeds of a lawn fete.

Mt. Sinai Hospital, \$5,000, and the New York Institute for the Instruction of Deaf and Dumb, New York City, one-half of the residue of the estate up to \$5,000, by the will of Moses Weinstein.

Children's Hospital, Boston Floating Hospital and Hospital Cottages at Baldwinville, Mass., each \$500 by the will of Francis F. Sears.

Mercy Hospital, Chicago, \$250,000 by the will of Charles Heines, St. Charles, Ill.

FOREIGN NEWS

Postponement of Pan-American Student Congress.—Business and finance are so demoralized in South America by the war in Europe that the Chilean minister at Washington has been officially notified that the international Pan-American congress of university students will not be held as announced at Santiago, in September, and is indefinitely postponed. A press dispatch states that three delegates from the United States are already on their way to Chili. The scope of the meeting was mentioned in these columns recently, page 696.

The Propaganda in Germany.—The recent annual representative assembly of the organized medical profession in Germany—the so-called Aerztetag—adopted a resolution to increase the dues a trifle in order to raise a fund of about \$6,200 annually to be expended in fighting quackery and nostrums. Part of the sum, also, is to be given to further the efforts of the German Council on Pharmacy and Chemistry. An editorial in the *Therap. Monatshefte* comments on this action of the Aerztetag as of far-reaching import, saying that such a decided practical measure taken by the profession itself to combat medical frauds cannot fail to exert an influence on the authorities above and on the rank and file of the profession below, and produce more of an effect than any amount of appeals to legislative factors.

Deaths in the Profession Abroad.—Dr. Gutierrez, count of San Diego, senator, director of the Instituto Rubio and a leading practitioner at Madrid, aged 63.—Dr. G. Vianna, assistant at the Oswaldo Cruz Institute for Infectious Diseases at Rio de Janeiro and author of the successful method of treating infection with species of *Leishmania* by intravenous injection of tartar emetic, has succumbed to infection professionally acquired, aged 30.—Surgeon-General Sir Anthony Dickson Home, V.C., K.C.B., probably the most distinguished officer on the retired list of the Royal Army Medical Corps; died in London, August 9, aged 87. He entered the medical corps in 1848 and served in the Crimean War and during the Indian Mutiny where he won the Victoria Cross by his heroic defense of the wounded left behind at Lucknow by the relieving column of Havelock. After this he served through the China, Maori and Ashantee campaigns and in 1880 was made surgeon-general and appointed Principal Medical Officer of Her Majesty's Forces in India. He was retired in 1886.—A. E. Cordes, a leading obstetrician and gynecologist connected with the university of Geneva, Switzerland, aged 69. He was a frequent writer of articles on his specialty, not only in French, but in British medical journals, and was one of the delegates to the international medical congress held in Washington in 1887 and secretary of the international congress on gynecology and obstetrics which met at Geneva in 1896.—Alfred Hegar, professor of obstetrics and gynecology at Freiburg i. B. until 1904, aged 84. Almost the last article from Hegar's pen was reviewed in *THE JOURNAL*, Nov. 8, 1913, warning that the catheter should never be used in examining the uterus, even when a pregnancy seems wildly improbable; he was discussing the lessons to be learned from the Niebergall case. He founded the *Beiträge zur Geburtshilfe und Gynaekologie*, now in its nineteenth volume.

CANADA

Personal.—Prof. Irving Heward Cameron has returned to Toronto.—Dr. William Grant Stewart, Montreal, and Dr. Maxwell Luterman, Montreal, have returned from Europe.—Dr. H. C. Wetmore, St. John, N. B., has been appointed deputy receiver-general at the port of St. John, N. B.

Toronto's Health.—Dr. Charles J. Hastings, municipal officer of health, has reported to the local board of health that during the past five years the death-rate in Toronto per 1,000 of population has decreased approximately 25 per cent. In August the total deaths were fourteen less than in August of last year. During the first eight months of the present year there were 421 fewer deaths than in the corresponding period of the past year. Owing to the establishment of the Child Welfare Department, there has been a marked decrease in infant mortality.

WAR NOTES

Medicine Embargo Raised.—The Russian government has authorized the Red Cross Society to import drugs and surgical instruments free of duty during the war.

Roentgen Returns Decoration.—Berlin papers state that Professor Roentgen has given back the gold medal presented him by the Royal Society in honor of his discovery, the reason assigned being the attitude of England in this war.

Red Cross Funds to Serbia.—The president of the Serb-American Red Cross Committee has sent by cable \$20,000 to the Red Cross Committee in Serbia, and also \$10,000 collected by the Serb-American Alliance of California. This money is being transmitted by way of Greece.

Hospital Unit Offered to Canada.—Dr. Kendall, secretary of the Edinburgh University Club of New York, has offered a hospital unit to the Canadian government composed of graduates of the university in the United States, the unit to be fitted out and equipped by its own members.

American Women's Hospital in London.—The American Women's Hospital in London, with accommodation for 200 patients and fully equipped through the efforts of American women in London, has been turned over to the War Office and is housing a large number of wounded soldiers.

Red Cross Surgeons Expect Call.—Surgeons available for Red Cross work and who have indicated their willingness for duty have been advised by the relief board to hold themselves in readiness for a call to duty at any time. A similar notice has been sent to the 5,000 Red Cross nurses registered in the United States.

Emigrant Station Turned Over to Red Cross.—The North German Lloyd Emigrant Railway Station at Bremen, which was completed in April last, has been turned over to the Red Cross for hospital purposes, and the package room of the station has been set apart as a depository for articles of food and clothing to be distributed by the Red Cross to the soldiers.

Daughters of Empire Equip Hospital.—Dr. Donald Armour and Sir William Osler are to have charge of the Queen's Canadian Military Hospital to be established in London, England, with the money raised by the Imperial Daughters of the Empire in Canada. Dr. Philippe Pelletier, agent-general for the province of Quebec in England, has been appointed a member of the medical staff of this hospital.

To Safeguard Soldiers' Health.—The specific request from the minister of militia for the services of Toronto's bacteriologist, Dr. George G. Nasmith, has been assented to by the Toronto Board of Health. Dr. Nasmith will, therefore, go to Europe with the first Canadian contingent to see that the soldiers have a good water-supply and to advise on all matters of sanitation.

No Dum-Dum Bullets.—French medical officers who were captured by the Germans at Namur and are on their way back to France by way of England, are said to have reported that they saw no evidence of soldiers having been wounded by dum-dum bullets on either side. The medical service of the Germans and allies was said to be excellent, but it was noted that the German wounded were often discharged too early from the hospitals.

The American Hospital.—The American Hospital which is housed in the Lycee Pasteur at Neuilly received its first lot of wounded, September 5. On the first sound of firing, the ambulances of this hospital dashed to the front, picked up the wounded and returned them rapidly to Neuilly. About fifty patients were accommodated at this time. An appeal has been made by prominent women of New York for \$250,000 for the hospital so that it may be able to provide 1,000 beds for wounded soldiers.

Our Austrian Exchanges.—The Vienna exchanges of *THE JOURNAL* arrive irregularly and with comparatively few pages, but the Association of Medical Publishers announce that they will make every effort to keep issuing their publications regularly, although in these troublous times it will not be possible to issue the medical periodicals in their complete form. They add that the lack of articles to publish would prevent this any way. Delays in distribution and transmission will be inevitable.

Red Cross Expedition Sails.—The American National Red Cross steamer, *Red Cross*, whose approaching departure was noted in last week's issue of *THE JOURNAL*, left her anchorage in Gravesend Bay, September 13. The delay in sailing was due to fear of international complications over

the make-up of the crew. In addition to the thirty surgeons and 125 trained nurses on the *Red Cross*, she carries a cargo of thousands of pounds of absorbent cotton, bandages, drugs and surgical instruments. Her first stop will be at Falmouth, England, where twenty-four nurses and six surgeons will be landed. She then proceeds to Rotterdam, where surgeons and nurses for Austria, Germany and Russia will disembark, and the balance will be taken to some French port, probably Cherbourg.

The Potassium Supply.—On another page mention is made of shortage of potassium compounds due to the interruption of commercial intercourse with Germany. Although the German monopoly of the market for potassium compounds is practically complete, commercial possibilities of potash exist in other countries. There are said to be resources in Spain, which, however, are undeveloped and likely to remain so for some time. After numerous false rumors it appears that a source of potash supply in this country is really about to be developed. The Secretary of the Interior has recently announced that within the next three months American potash would be produced at Searles Lake, Cal. The maximum production of the plant is expected to be between 37,000 and 38,000 tons a year. The amount of German potash annually imported is estimated to exceed 230,000 tons, so that this source of domestic supply will not of itself meet the demands of the country. Economy will still be necessary with reference to potassium compounds.

PARIS LETTER

PARIS, Sept. 4, 1914.

The War

The seriousness of the political events which have occurred since my last letter have drawn universal attention to the war. As a matter of course, medical life has also felt the effects of the great European conflagration. The readers of *THE JOURNAL* will therefore pardon me if my present letter is devoted altogether to matters connected with the war.

Patriotic Devotion of the Medical Profession

A large number of physicians with no military connection have offered their services to the war department. Especially notable is the case of Dr. Darroze, who took part in the campaign of 1870 as a physician and who to-day aged 68, has gone to the front, resuming the position that he occupied forty-four years ago. The army is at present well supplied with physicians. A detachment of the French *Red Cross*, composed of sixteen physicians, has set out for Serbia.

The services of the *Assistance Publique*, having been reduced by mobilization, have already been completely reorganized. On the other hand, some sections of the country being completely deprived of physicians by the mobilization, it is recommended that physicians who have no military obligations, and who are able to leave their customary residences, should inform the director of the sanitary service of the army corps in their vicinity, who will dispose of their services according to the needs that may arise.

Resources of the French Red Cross

The French *Red Cross* is composed of three societies, the *Société de secours aux blessés*, the *Association des Dames françaises* and the *Union des Femmes de France*. The first of these societies can put at the disposal of the war department 260 auxiliary hospitals with 17,000 beds; the second has 160 auxiliary hospitals with about 6,000 beds; the third has 180 auxiliary hospitals with 12,000 beds; altogether 600 auxiliary hospitals provided with about 35,000 beds and a staff ready to act. Moreover, each one of these societies receives fresh offers of assistance every day. The supplementary nurses, who are already offering their services in great number, will make it possible to open supplementary hospitals in many private buildings already placed at the disposal of the *Red Cross* as well as in college and other educational buildings. The *Union des Femmes de France* has organized sixty flying detachments each composed of a head nurse and six nurses under her, ready to leave for the front or for the military hospitals. The 10,000 nurses that the union has trained, many of whom have already had experience in Morocco, are prepared to start.

Advice to Surgeons with Regard to Wounds in War

August 10, Dr. Edmond Delorme, inspector general of the military health service, read a paper on this subject before the *Académie des Sciences* in which he emphasized the fact that at present military surgery ought to be conservative in

almost all cases, especially of bullet wounds. The small caliber of the wounds made by the bullets now used, the fact that the practice now is to refrain from probing the wounds, and the antiseptic and aseptic methods in use, have transformed the prognosis of most military wounds, have lessened complications and losses and have improved the results. The surgeon, therefore, ought to strive to cure, leaving the fewest possible ill effects. The methods of military surgery at the front necessarily differ from ordinary surgery, but in the hospitals at the rear they approach those of ordinary surgery.

Dr. Delorme reviewed successively the treatment of wounds of the soft parts produced by the pointed German bullet—wounds which are generally very narrow, not soiled with fragments of clothing and which are cured in a few days or weeks; treatment of wounds produced by the round ball of shrapnel and the treatment of fractures. For the latter conservation ought to be the rule. It insures recovery in the vast majority of cases, no matter what the bone affected or what the extent of the degree of comminution of the fracture. In abdominal wounds with intestinal lesions, though there may be room for argument as to the advisability of immediate laparotomy in ordinary surgery, it is altogether inadvisable in military surgery. The most recent wars, those in the Transvaal, Manchuria and the Balkans, have shown the harmfulness of laparotomy. In the Transvaal, laparotomy, though practiced by eminent surgeons, under most favorable conditions, gave fewer recoveries than did non-operative treatment.

The German bullet makes a small orifice in entering the abdomen and carries with it no infecting substance from the clothing. In the intestinal loops it makes only the smallest perforations which tend to close spontaneously. For such injuries the old treatment seems sufficient, namely, absolute rest, the patient not being transported to any distance, and complete abstinence from food and drink, especially the latter, for several days. This régime is rendered endurable by constantly rinsing out the mouth, employing rectal or subcutaneous injections of artificial serum with opium and keeping the patient in Fowler's position.

When, on the other hand, the speed of the projectile has been greater, when the bullet has ricocheted or when in case of the large shrapnel ball, the orifice of entry is larger, the intestinal wound or wounds are also larger and less apt to close spontaneously. Also the introduction of shreds of clothing is frequent. In such cases peritoneal infection is certain. The proper treatment is, in addition to measures already indicated, the use of the drop method of proctoclysis; the abdomen is opened rapidly and cleansed with ether after Morestin's method (*THE JOURNAL*, June 21, 1913, p. 1971) and drainage instituted.

Dr. Delorme emphasizes especially the fact that this operation is no longer the complicated procedure of classic laparotomy, which a staff of trained surgeons cannot perform more than three or four times a day while neglecting other wounded men, a fatiguing operation, increasing shock, liable to destroy reparative adhesions, demanding special surroundings and minute aseptic precautions in order that it may not give fewer recoveries than non-operative treatment. It is, on the other hand, a very simple, rapid procedure, within the ability of any practitioner. The *Académie des Sciences* has decided to suggest to the war department that Dr. Delorme's paper be printed for distribution to all the military physicians and surgeons of our army.

The Academy of Medicine and the War

The *Académie de médecine* has decided unanimously that all its members would place themselves at the disposal of the government for any purpose for which they may be useful to the country. It has asked to be given the necessary animals and apparatus for manufacturing small-pox vaccine. In view of the possible danger of small-pox epidemics, so common during war, the academy believes that not only children ought to be vaccinated, but all persons who have not been vaccinated within seven years. Instructions have been issued to the director of primary instruction and to the medical inspectors of schools to have all children attending the public and private schools revaccinated as soon as possible. Instructions have also been given to the general administration of the *Assistance Publique* (public charities) to have every applicant for help vaccinated or revaccinated.

In view of the possible danger of the spread of typhoid, the *Académie de médecine* has drawn the attention of the interior department to the opportunity for antityphoid vaccination, suggesting that such vaccinations be accomplished as soon as possible.

The Academy of Sciences and the War

In view of the serious situation of the country, the Académie des sciences has decided, as suggested by its president, Professor Appell, dean of the Faculté des sciences, to place itself at the disposal of the national defense. This resolution having been communicated to the government, some of the members were immediately placed, respectively, on commissions on the subjects of wireless telegraphy, aviation, explosives, hygiene and medicine.

The Jean-Jacques Berger prize having been awarded by the five academies of the institute successively to the most meritorious work affecting the city of Paris, was turned over by the Académie des sciences to the marquis de Vogüé, president of the Red Cross, for the military hospital of the institute at the hôtel Thiers.

Prohibition of Absinthe

The prefect of police of Paris forbade the sale of absinthe during the first days of mobilization. The Académie de médecine unanimously voted its congratulations to the prefect of police for this measure. Some of the prefects of the departments promulgated the same rule. At last the sale of absinthe, either to be consumed on the spot or in bottles to be carried away, has been forbidden by order of the minister of the interior throughout all France.

An American Organization

A Franco-American committee has been formed to assist in protecting from the horrors of war the children and young girls in the zone of operations. It will give its aid to such organizations as appear to be able to give the best care to such children and young girls during the war. It will reserve the right of advice and control in the name of its subscribers. The bureau of the committee is the following organization: president, Mrs. Cooper Hewitt; vice-president, Mrs. Robert Bliss; secretary, M. Auguste F. Jaccaci; treasurer, Mr. Frederic R. Coudert. Subscriptions may be addressed to MM. Coudert frères, boulevard Haussmann, 39, Paris, and Coudert Brothers, 2 Rector Street, New York.

The Offer of the Deaf-Mutes

M. Tournade, deputy of the Seine, has sent to the minister of war a letter in which deaf-mutes demand the honor of being utilized for the national defense. They explain that their infirmity is more apparent than real. Most of them are well built, healthy and strong and accustomed to take part in sports and gymnastics. There have formerly been deaf-mute soldiers, some of them volunteers; many of them are excellent shots, sight being more necessary for this than hearing. It is thought, however, that they may be better utilized for military purposes in the capacity of cyclists for carrying secret messages, as members of the ambulance corps, or in the auxiliary services in the national factories of arms and ammunition (where some of them are already employed) or in the national printing establishment, where others are also employed to fill the vacancies caused by mobilization.

War and the Medical Journals

On the fourth day of mobilization, the *Semaine Médicale* informed its subscribers that publication was indefinitely suspended. The *Presse Médicale*, though unable to continue to appear in its regular form, has been continued as a sheet of medico-military information.

Personal

Dr. Augagneur, formerly professor of the Faculté de médecine de Lyon, whose appointment as minister of public instruction I have already mentioned (THE JOURNAL, Aug. 1, 1914, page 415), has just vacated this position, having been appointed minister of the marine.

BERLIN LETTER

BERLIN, Aug. 22, 1914.

Personal

August 6, Alfred Hegar, a prominent German gynecologist, died at the age of 84. Hegar may be regarded as the founder of modern gynecology, especially of operative gynecology. In 1864, he was called to Freiburg as the successor of Professor Spiegelberg, without having previously held a university position. At this place he was for forty years the regular professor and director of the gynecologic clinic. His scientific works extend over the entire field of gynecology. A number of his treatises have a close relation to psychology

and social medicine. His principal work is the text-book of operative gynecology which he wrote in conjunction with his pupil, Kaltenbach. A number of years ago, in spite of his advanced age, he founded a journal entitled *Beiträge zur Geburtshilfe und Gynäkologie*, which contributed markedly to his reputation.

The War

Since the numerous bloody encounters, the activity of the surgeons has already begun. Under the specially favorable conditions of transportation, the effort will prevail, I believe, to treat the wounded not in the field hospitals but, so far as possible, to convey them in the hospital trains to their homes where they can doubtless be better cared for in the roomy and orderly regular hospitals. Already hospital trains carrying wounded have reached Stuttgart, Frankfurt and even Berlin. There are plenty of surgeons ready for their treatment. In the general enthusiasm, helpfulness and readiness for self-sacrifice which possess the entire German people in a remarkable way, physicians, as a matter of course have not remained the hindmost. Physicians to a far greater extent than necessity demanded have voluntarily offered themselves for the army in the field as well as for service in the hospitals. To be sure, gradually every force which is available may be demanded because in battles between armies numbering millions, the number of wounded will be enormous provided that peace is not concluded sooner than one can dare to hope for. In our army, evidence of whose brilliant organization is shown on all sides in the wonderfully rapid and smooth mobilization, the army medical service is certainly not in the lowest place and one may be sure that it will be completely equal to the task. Unfortunately, already some army surgeons have fallen on the battle-field. Naturally also, the sons of many physicians have already fallen. For instance, a son of Erb, the Heidelberg clinician, as well as the son of Surgeon-General Scheibe, formerly medical director of the Charité.

Since a large part of the civilian physicians who have gone into military service are not familiar with military surgery and military service in general, courses of instruction by active army surgeons will be held in all university towns, especially in Berlin, for the voluntary army surgeons.

Marriages

OSWALD SWINNEY LOWSLEY, M.D., Santa Barbara, Cal., to Miss Katherine V. Staples of Troy, N. Y., at Round Lake, N. Y., August 20.

LEONARD FORREST WOODWORTH, M.D., to Miss Bertha Victoria Fickling, both of LeSueur Center, Minn., September 8.

SOLON WASHINGTON CORNISH, M.D., Everett, Mass., to Miss Beatrice Melbourn Hosking of Chelsea, Mass., September 7.

ARTHUR MONROE CALVERT, M.D., Chicago, to Miss Anna May Gorby of Cave City, Ky., at Indianapolis, September 5.

THOMAS PATRICK HENNELLY, M.D., Pittsfield, Mass., to Miss Helena E. Wickham of South Lee, Mass., August 11.

JOHN CAMPBELL MORFIT, M.D., St. Louis, to Miss Sallie Hockaday Van Deventer of Mexico, Mo., September 1.

DANA FRANK CUMMINGS, M.D., Cherryfield, Maine, to Mrs. Blanche R. Day of Rockland, Mass., September 1.

NORMAN MARSHALL SMITH, M.D., to Miss May Louise Durst, both of Minneapolis, Minn., September 2.

HARRY STARK HOLMES, M.D., Glendive, Mont., to Miss Leota Robinson of Forsyth, Mont., August 29.

HOWARD NORTON FLEXER, M.D., Lakeview, Mich., to Miss Irene E. Singer of Sycamore, Ill., August 24.

EARL H. SNAVELY, M.D., Cedar Grove, N. J., to Miss Elizabeth C. McMahon at Newark, N. J., June 25.

LAWRENCE JEUS KAASA, M.D., to Miss Julia Olivia Thompson, both of Lake Mills, Iowa, September 2.

ARCHIBALD CARY LEWIS, M.D., to Miss Ruth D. Hatton, both of Memphis, Tenn., about June 2.

LEON BRAYTON HARRIS, M.D., to Miss Rosemary Laveck, both of Saginaw, Mich., September 7.

OSWALD PATRICK GOODALL, M.D., to Miss Harriet Blake, both of Los Angeles, September 1.

JAMES R. HARVEY, M.D., Footville, Wis., to Miss Helen Langdon of Chicago, August 26.

Deaths

Martin Hayward Post, M.D. Washington University, St. Louis, 1877; a prominent oculist of St. Louis; a Fellow of the American Medical Association and a member and once president of the American Ophthalmological Society; a member of the staff of St. Luke's Hospital, St. Louis Protestant Hospital, Missouri Baptist Sanitarium and ophthalmic surgeon to the Missouri School for the Blind; who went to Castle Park, Mich., in the middle of the summer to recuperate after an attack of pneumonia; died in Castle Park, September 2, from heart disease, aged 63.

George F. Jenkins, M.D. Missouri Medical College, St. Louis, 1867; a Fellow of the American Medical Association and fourth vice-president in 1903-1904; twice president of the Keokuk Medical Society and president of the Iowa State Medical Society in 1891; president and professor of principles and practice of medicine and clinical medicine, and physiology in Keokuk Medical College; chief of staff of St. Joseph's Hospital; eminent as a teacher and practitioner and universally beloved; died in St. Joseph's Hospital, Keokuk, September 4, aged 72.

Alexander Shirley Levery, M.D. College of Physicians and Surgeons in the City of New York, 1890; clinical instructor in medicine in Cornell University Medical College; a member of the New York Neurological Society; visiting physician to St. Luke's Hospital; died suddenly in his apartment in New York City, about August 28, from cerebral hemorrhage, aged 48.

Joseph S. Sutphen, M.D. New York University, New York City, 1865; for nearly half a century a practitioner of Newark, N. J., and for many years physician to the Essex County prison; from 1878 to 1880 a member of the Board of Freeholders, and in 1891 a member of the Board of Education of Newark; died at the home of his sister in that city, August 20, aged 74.

William Freeman Nye, M.D. Northwestern University Medical School, 1878; for nearly forty years a practitioner of Minneapolis; a Fellow of the American Medical Association; for four years a member of the board of aldermen and for several years deputy coroner of Hennepin County; died at the home of his daughter at Mound, Lake Minnetonka, Minn., August 30, aged 63.

William Lofland Dudley, M.D. Miami Medical College, Cincinnati, 1885; of Nashville, Tenn.; formerly dean of Vanderbilt University, Nashville, Tenn.; once president of the Southern Intercollegiate Athletic Association and known as the "father of Southern athletics"; died September 8, on a train near Clifton Springs, Mich., from cerebral hemorrhage, aged 55.

Enoch Wood Keegan, M.D. Rush Medical College, 1861; surgeon in the Federal service during the Civil War; for more than half a century a practitioner of Crawfordsville, Ind.; a member of the city council and for one term coroner of Montgomery County; died at his home in Crawfordsville, August 29, from cerebral hemorrhage, aged 78.

Milton M. Walker, M.D. University of Maryland, Baltimore, 1867; a charter member of the Medical Society of Virginia, and corresponding secretary of the society from 1880 to 1882; a Confederate veteran and also surgeon of U. S. Volunteers during the Spanish-American War; died at his home in Oldhams, Va., June 27, aged 71.

William C. Gouinlock, M.D. College of Physicians and Surgeons in the City of New York, 1865; University of Toronto, Ont., 1879; for more than thirty years a resident of Warsaw, N. Y., and identified with the salt industry of that place; died in the Warsaw Hospital, August 30, after an operation for disease of the intestine, aged about 70.

Joseph Henry Byrne, M.D. College of Physicians and Surgeons in the City of New York, 1885; of New York City; a Fellow of the American Medical Association and the New York Academy of Medicine; died suddenly from heart disease in New York City, August 27, aged 49.

Helen DeWitt Justin, M.D. Woman's Medical College of the New York Infirmary for Women and Children, New York City, 1879; of Castle, N. Y.; a member of the Medical Society of the State of New York; died in Rochester, Minn., July 19.

Thomas B. Owings, M.D. University of Maryland, Baltimore, 1852; died at his home in Ellicott City, Md., August 28, from senile debility, aged 84.

Alexander Hazard, M.D. University of Pennsylvania, Philadelphia, 1867; a medical cadet during the Civil War; formerly a practitioner of Ouray, Colo., and later a resident of Philadelphia; died at his summer home in Atlantic City, N. J., August 25, aged 67.

Richard P. Walker, M.D. Kansas City (Mo.) Medical College, 1883; Jefferson Medical College, 1855; a member of the Missouri State Medical Association; died at his home in Belton, Mo., August 26, from cerebral hemorrhage, aged 54.

Alexander Hunter, M.D. University of Colorado, Boulder, 1894; University and Bellevue Hospital Medical College, 1899; local surgeon for the Northern Pacific Railroad at Coeur d'Alene, Idaho; died at his home in that city, August 7, aged 47.

Samuel R. Bird, M.D. University of Pennsylvania, Philadelphia, 1853; formerly a member of the Maryland House of Delegates from Calvert County and later in the customs service; died at his home in Baltimore, August 17, aged 86.

Levi D. Sheets, M.D. New York University, New York City, 1849; surgeon with the cavalry division of the Second Army Corps during the Civil War; died at his home in Glen Ridge, N. J., August 24, aged 88.

William D. Flack, M.D. Northwestern University Medical School, Chicago, 1912; of Farmington, Ill.; died in Wesley Hospital, Chicago, August 26, from meningitis following a mastoid operation, aged 31.

Dudley Leavitt, M.D. College of Physicians and Surgeons in the City of New York, 1890; of West Stockbridge, Mass.; died in a hospital in Pittsfield, Mass., August 23, from malignant disease, aged 50.

William L. Gaboury, M.D. Queens University, Kingston, Ont., 1912; of Pembroke, Ont.; while driving across a railroad track recently, was struck by a train and instantly killed, aged 25.

Henry Greggs Farish, M.D. University of Pennsylvania, Philadelphia, 1849; for sixty-four years a resident of Liverpool, N. S.; died at his home in that place, June 30, aged 88.

Elwin H. Damon, M.D. Cleveland University of Medicine and Surgery, 1878; of Rittman, Ohio; died in a hospital in Cleveland, August 20, after a surgical operation, aged 63.

James Henry Sanderson, M.D. College of Physicians and Surgeons in the City of New York, 1890; died at his home in Worcester, Mass., August 28, from pneumonia, aged 47.

James Bruce Coleridge, M.D. Trinity Medical College, Toronto, Ont., 1901; three times mayor of Ingersoll, Ont.; died at his home, July 7, from nephritis, aged 35.

Samuel D. Griffith, M.D. Starling Medical College, Columbus, Ohio, 1886; of Columbus; died at the home of his brother in Worthington, Ohio, August 19, aged 53.

John N. Wilkins, M.D. National Medical University, Chicago, 1896; formerly of Chicago; died at the home of his daughter in Oakland, Cal.; recently, aged 83.

Frederick Parker, M.D. Trinity Medical College, Toronto, Ont., 1895; of Stratford, Ont.; died suddenly in his automobile, July 11, from heart disease, aged 50.

Arthur Watson Grover, M.D. Western University, London, Ont., 1907; formerly of Brandon, Man.; died at his home in Dresden, Ont., June 28.

Stephen H. Cloyd, M.D. Eclectic Medical Institute, Cincinnati, 1887; died at his home in West Alexandria, Ohio, July 29, aged 53.

Henry Walmsley Welch, M.D. Trinity Medical College, Toronto, 1890; of Okotoks, Alta.; died in Calgary, Alta., July 7, aged 48.

Addison Alexander Armstrong, M.D. University of Michigan, Ann Arbor, 1883; died at his home in Athens, Pa., June 10, aged 55.

Robert Boyd, M.D. Barnes Medical College, St. Louis, 1897; died at his home in Weatherford, Texas, July 10, aged 45.

Almena Jane Baker Flint, M.D. Boston University School of Medicine, 1876; died recently in her apartment in Boston.

John W. Bronaugh, M.D. Washington University, St. Louis, 1861; died at his home in Mounds, Okla., August 6, aged 80.

Charles Edward Winslow, M.D. Rush Medical College, 1882; died at his home in Monrovia, Cal., June 19, aged 59.

Arthur Vaillancourt, M.D. Laval University, Quebec, 1899; died at his home in Waterloo, Que., July 2, aged 38.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

PATENT MEDICINES IN GREAT BRITAIN

The Report of the Select Committee on "Patent Medicines" with Its Findings and Recommendations

More than two years ago the British government appointed a Select Committee on Patent Medicines to investigate the nostrum evil in that country. THE JOURNAL has, from time to time, called attention to the fraudulence of the "patent medicine" business across the water, and has emphasized the fact that Great Britain is some years behind the United States in attempting to curb one of the greatest evils that menace the public health. Long after the Food and Drugs Act brought about a certain moderation in claims on the labels of American "patent medicines" as sold in this country, the same nostrums were sold in Great Britain under claims that obtained in this country in pre "pure-food-law" days. In other words, the nostrum labels on the British market contained the same false and fraudulent claims that characterized the labels of the same product in this country before the passage of the Food and Drugs Act.

These facts were brought out in detail in the article, "American and British Labels," that appeared in this department in THE JOURNAL for July 20, 1912. At about the same time a series of educational charts dealing with "patent medicines" and quackery were prepared by the Propaganda Department for the American Medical Association's exhibit at the Fifteenth International Congress on Hygiene and Demography. Some of these charts called attention specifically to the difference in the claims made for the same product on American and British labels, respectively. During the summer of 1912 the British embassy through the British consulate at Philadelphia, requested the American Medical Association to furnish the Select Committee with such data as it had on the subject of "patent medicines" and quackery. A full set of the literature prepared in the Propaganda Department was forwarded, together with some of the educational charts that dealt specifically with the difference in labeling of "patent medicines" in Great Britain and the United States, respectively.

The hearings before the Select Committee were exceedingly interesting and brought out many facts long known to those who had investigated the subject, but little appreciated by the general public. Some of these have been referred to at different times in THE JOURNAL. Those of our readers who are interested in the propaganda against fraud in medicine will appreciate the value of the report that has recently been presented by the Select Committee on "patent medicines," whose findings and recommendations we quote in full.

THE FINDINGS OF THE COMMITTEE

After carefully considering the evidence that was laid before it the committee reported its findings as follows:

"1. That there is a large and increasing sale in this country of patent and proprietary remedies and appliances, and of medicated wines.

"2. That these remedies are of widely differing characters, comprising (a) genuine scientific preparations; (b) unobjectionable remedies for simple ailments, and (c) many secret remedies making grossly exaggerated claims of efficacy, causing injury by leading sick persons to delay in securing medical treatment, containing in disguise large proportions of alcohol; sold for improper purposes; professing to cure diseases incurable by medication; or essentially and deliberately fraudulent.

"3. That this last-mentioned class (c) of remedies contains none which spring from therapeutical or medical knowledge, but that they are put on the market by ignorant persons, and in many cases by cunning swindlers, who exploit for their own profit the apparently invincible credulity of the public.

"4. That this constitutes a grave and widespread public evil.

"5. That in British Dominions and foreign countries severe legal restrictions exist, and that there is a tendency still further to strengthen the law against these articles.

"6. That no department of state and no public officer is charged with the duty of controlling the sale and advertisement of proprietary remedies in this country; that the home office and the local government board are virtually powerless in this respect; that the privy council office, though supposed to be specially concerned with the sale of drugs, has no initiative in the matter, and, in fact, it fulfils no useful function in this connection.

"7. That the existing law is chaotic and has proved inoperative, and that successful prosecution for fraud in the advertisement and sale of secret remedies is fraught with the greatest difficulty, though the public prosecutor has perhaps not sufficiently tested the powers of the existing law in respect to such cases.

"8. That consequently the traffic in secret remedies, except as regards scheduled poisons and the grosser forms of impropriety, is practically uncontrolled in this country.

"9. That this is an intolerable state of things, and that new legislation to deal with it rather than merely the amendment of existing laws is urgently needed in the public interest.

"10. That grave injury is caused to the public by the existing large sale of medicated wines.

"11. And that while, for reasons already given, it is not desirable to require the exhibition of formulas of every secret remedy, nevertheless it is improper that under the protection of the law enormous quantities of alleged remedies should be sold the composition of which is unknown to any person except the manufacturers of them; and that, therefore, the formulas of all secret remedies should be required to be communicated to a competent officer appointed under the authority of a minister of state, but that such formulas should not be divulged to any other person except as hereinafter recommended."

THE RECOMMENDATIONS OF THE COMMITTEE

The committee therefore recommends:

"1. That the administration of the law governing the advertisement and sale of patent, secret and proprietary medicines and appliances be coordinated and combined under the authority of one department of state.

"2. That this administration be part of the functions of the ministry of public health when such a department is created, and that in the meanwhile it be undertaken by the local government board.

"3. That a competent officer be appointed to this department, with the duty of advising the minister at the head of the department concerned regarding the enforcement of the law in respect of these remedies.

"5. That there be established at the department concerned a register of manufacturers, proprietors and importers of patent, secret and proprietary remedies, and that every such person be required to apply for a certificate of registration and to furnish (a) the principal address of the responsible manufacturer or representative in this country, and (b) a list of the medicine or medicines proposed to be made or imported.

"6. That an exact and complete statement of the ingredients and the proportions of the same of every patent, secret and proprietary remedy; of the contents other than wine, and the alcoholic strength of every medicated wine, and a full statement of the therapeutic claims made or to be made; and a specimen of every appliance for the cure of ailments other than recognized surgical appliances be furnished to this department, such information not to be disclosed except as hereinafter recommended, the department to control such statement, at their discretion, by analyses made confidentially by the government chemist.

"7. That a special court or commission be constituted with power to permit or to prohibit in the public interest, or on the ground of non-compliance with the law, the sale and advertisement of any patent, secret or proprietary remedy or appliance, and that the commission appointed for the purpose be a judicial authority, such as a metropolitan police magistrate sitting with two assessors, one appointed by the department and the other by some such body as the London Chamber of Commerce.

"8. That the president of the local government board (or minister of health) have power to institute the necessary

proceedings to enforce compliance with the law, the sale and advertisement of any patent, secret or proprietary remedy or appliance.

"9. That a registration number be assigned to every remedy permitted to be sold, and that every bottle or package of it be required to bear the imprint 'R.N. . . .' (with the number), and that no other words referring to the registration be permitted.

"10. That in the case of a remedy the sale of which is prohibited the proprietor or manufacturer be entitled to appeal to the high court against the prohibition.

"11. That the Department be empowered to require the name and proportion of any poisonous or potent drug forming an ingredient of any remedy to be exhibited on the label.

"12. That inspectors be placed at the disposal of the department to examine advertisements and observe the sale of proprietary remedies and appliances.

"13. That an annual fee be payable in respect of every registration number issued."

Believing that some of the existing laws could be so amended as to give greater protection to the public, the committee recommended:

"1. That the Stamp Acts be consolidated and amended to remove the numerous existing anomalies and unreasonable exceptions. In this connection pure drugs vended entire under a fancy name should no longer be exempt from duty; the distinction between the name of an ailment and the name of an organ the seat of that ailment should be abandoned; and the exemption of medicines generating carbonic-acid gas should be omitted. Further, any reference in advertising matter to the government stamp should be prohibited, and a name of a proprietor or firm should be printed on the stamp.

"2. That the Indecent Advertisements Act be amended on the lines of Lord Bray's Bill."

In addition to the foregoing amendments, the committee recommends the following legislative enactments:

"1. That every medicated wine and every proprietary remedy containing more alcohol than that required for pharmacological purposes be required to state on the label the proportion of alcohol contained in it.

"2. That the advertisement and sale (except the sale by a doctor's order) of medicines purporting to cure the following diseases be prohibited:

Cancer	Diabetes	Locomotor ataxia
Consumption	Paralysis	Bright's disease
Lupus	Fits	Rupture (without operation or appliance)
Deafness	Epilepsy	

"3. That all advertisements of remedies for diseases arising from sexual intercourse or referring to sexual weakness be prohibited.

"4. That all advertisements likely to suggest that a medicine is an abortifacient be prohibited.

"5. That it be a breach of the law to change the composition of a remedy without informing the department of the proposed change.

"6. That fancy names for recognized drugs be subject to regulation.

"7. That the period of validity of a name used as a trade mark for a drug be limited, as in the case of patents and copyrights.

"8. That it be a breach of the law to give a false trade description of any remedy, and that the following be a definition of a false trade description:

"A statement, design, or device regarding any article or preparation, or the drugs or ingredients or substances contained therein, or the curative or therapeutic effect thereof, which is false or misleading in any particular."

"And that the onus of proof that he had reasonable ground for belief in the truth of any statement by him regarding a remedy be placed on the manufacturer or proprietor of such remedy.

"9. That it be a breach of the law:

"(a) To enclose with one remedy printed matter recommending another remedy.

"(b) To invite sufferers from any ailment to correspond with the vendor of a remedy.

"(c) To make use of the name of a fictitious person in connection with a remedy. (But it should be within the

power of the department to permit the exemption of an old-established remedy from this provision.)

"(d) To make use of fictitious testimonials.

"(e) To publish a recommendation of a secret remedy by a medical practitioner unless his or her full name, qualifications and address be given.

"(f) To promise to return money paid if a cure is not effected.

"In conclusion, the committee believes that departmental and legislative action as outlined above will not inflict injustice on any patent or proprietary medicine or appliances; that it will, alike by its operative and its deterrent effect, afford the public efficient and urgently needed protection against injury and fraud; and that no measures of a smaller scope will secure this result."

Correspondence

The Levator Ani versus the Bulbocavernosus in Pelvic Floor Repair

To the Editor:—On page 540 of THE JOURNAL of Aug. 15, 1914, appears the following statement by Goldspohn: "The bulbocavernosus, surrounding the vulvar opening, reenforces the inner margin of the trigon; and these together are what some operators have mistaken for the levator ani, whose anterior median edges lie farther within, are less distinct and extend more in an inward and upward direction. This mistake is apparent from the illustrations and described technique [italics mine] of Robert T. Morris, Arnold Sturmdorff, C. A. Hall, George B. Somers and C. W. Barrett." It is true that these names were not read in the presentation of his paper, no doubt to spare our feelings.

In the printed discussion he says: "While Dr. Barrett may now be going deep enough to seize the levator, he has repeatedly mistaken the inner edges of the trigon and the bulbocavernosus muscle as the levator ani in his illustrations." Dr. Goldspohn's comment, in closing the discussion after my lantern-slides were shown at Atlantic City, was, "Dr. Barrett's illustrations now show that he goes deep enough but," etc. [italics mine].

As I have laid stress for years on the importance, not only of going deep enough to get the levators, but of actually picking up the levators as we would pick up the definite anatomic structures in doing an inguinal herniotomy, I must insist that Dr. Goldspohn is mistaken, and present the following description of my work as it appears in the article quoted by him as proof thereof:

The first part of the article takes up the anatomy, embryology, comparative anatomy and variations of the levator ani muscle and its importance as a part of the closure of the abdomen in upright animals, and the importance of dealing with this muscle in pelvic floor repair. It lays stress on the importance of starting the flap at the vaginovesibular junction so as not to close the vagina with vulvar structures. It then reads: "The dissection is carried between the vagina and rectum until we are above the levator ani muscle (about 1½ inches) and well to the sides to uncover these muscles. The guide is not to be indicated in inches, however, as the test is to be able to find the muscle. With the flap held forward the index finger of the left hand crowds the rectum backward and puts the levator on the stretch. With a strong round curved needle that would about fit the three-eighths circumference of a silver half dollar, and threaded with catgut, we pick up a good bite of the left levator ani muscle as far forward as we wish to unite it; we then include a little of the deep part of the flap, after which the needle picks up a corresponding portion of the levator muscle on the right side. With the same suture and needle we now go back to the left side and pick up the levator ani muscle one-half inch nearer the rectum; the needle is then made to pick up a portion of the rectal wall, after which it picks up a corresponding portion of the levator muscle on the right side" (Barrett: Obstetrics and Diseases

of Women, April, 1909). The description continues in detail to the complete closure of the wound. Conclusion 10 reads: "Two points should be observed in the herniotomy of the pelvic floor: (a) The levator ani muscles should be reunited. (b) Superficial vulvar structures should not be reunited but left with the natural vulvar opening into the vagina, which may easily be accomplished by making the V-shaped incision at the lower end of the vagina instead of the usual incision in the labia majora."

This form of perineal hernioplasty has been demonstrated to many who have honored me by their presence, and is not so complicated as Dr. Goldspohn seems to think.

CHANNING W. BARRETT, M.D., Chicago.

The above correspondence was referred to Dr. Goldspohn, who replied:

To the Editor:—I read my paper at the Atlantic City meeting in more abbreviated form than was needed to remain within the time limit. I said in closing the discussion, in substance, that I believe that Dr. Barrett is now (meaning recent years) going deep enough within the pelvis to deal with the levator, or that he probably does so; but that he has an illustration in his first publication on this subject (*Am. Jour. Obst.*, etc., April, 1909, p. 565), in which he represents the levator ani muscle as lying in an altogether more conspicuous and superficial position than it is possible to show it in any normal dissection, unless the urogenital trigon and the bulbocavernosus muscles have first been dissected off. This is an anatomic fact, which Dr. Barrett cannot deny without taking issue with the authorities on anatomy cited in my paper; and criticism is in order as long as he does not admit the mistake set forth in that illustration.

ALBERT GOLDSPOHN, M.D., New York.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

TEST FOR PURITY OF WATER

To the Editor:—1. Please inform me as to a simple test for purity of water.

2. What is best to use to rid a well of unpleasant odors arising, I think, from the overflow into it of surface water impregnated with alkali earth.

JAMES D. KENNEDY, M.D., Ganado, Ariz.

ANSWER.—1. If by "purity" of water is meant inability to convey disease, there is no simple test. Determination of the relative abundance of *Bacillus coli* in a water is perhaps the most important single method now in use, but it must be employed with great care and the results can be properly interpreted only after long experience in water analysis.

2. Unless the source or nature of the unpleasant odor is known it is impossible to tell how to prevent it. Surface water should not be allowed to enter any well. Consult your State Board of Health in regard to the whole question. The board will perhaps make analyses or inspection for you.

CAUSE OF EYELID QUIVERING—COMPOSITION OF "MUM"

To the Editor:—1. I have a patient, woman, aged 52, who for three months has had a marked "quivering" of the right eyelid. Several physicians have tried "practically everything" without giving any relief. At times these contractions of the lower lid and cheek muscles are so violent that the patient is unable to work or sleep. Physical examinations have proved negative. A slight refractive error was corrected two months ago.

2. Can you give me the composition of "Mum," a deodorant of perspiration made by the Mum Manufacturing Company of Philadelphia? I have recently seen a case of a peculiar axillary dermatitis in which this preparation may have caused the trouble. What is the usual deodorizing substance in these toilet articles?

E. E. WISEHART, M.D., Snow Hill, Md.

ANSWER.—1. It is rather difficult to offer any very intelligent advice without knowing more about the daily life and habits

of the patient. Has an examination of the accessory nasal cavities been made? Have the teeth been examined, especially those on the right side of the upper jaw? Have the physical examinations failed to show the presence of any general toxemic condition? Does the woman use her eyes excessively for close work of any kind: reading, writing, sewing, etc.? If the foregoing examinations prove negative, it would be wise to have her eyes thoroughly examined under complete cycloplegia so that the refractive error as well as the amount of presbyopia present can be absolutely corrected and the muscle balance carefully worked out. A greatly diminished power of prism convergence especially in eyes under excessive strain, could easily produce reflex symptoms of this kind.

2. This query was answered in *THE JOURNAL*, Nov. 30, 1912, p. 1993.

LITERATURE ON STATE CONTROL OF TUBERCULOSIS

To the Editor:—I have been appointed one of a commission of five to draw up a comprehensive plan for a thorough antituberculosis campaign in this territory, which plan we are to submit to the Governor not later than Jan. 1, 1915. I wish you would give me a list of books on the subject from which I might get the best idea about hospital formation, sanatoriums, etc., and the various methods of handling this subject by the State Board of Health. With our delightfully even climate we should be able to eradicate this disease almost entirely.

A. I., M.D., Hawaii.

ANSWER.—The following is a list of books and pamphlets; further references are contained in most of these:

Some Plans and Suggestions for Housing Consumptives, National Association for Study and Prevention of Tuberculosis, 105 East Twenty-Second Street, New York.

Battling for Health at Mont Alto, *Pennsylvania Health Bull.*, October, 1912.

A Preliminary Abstract of the Final Report of the California Tuberculosis Commission, *California State Board of Health Bulletin*, January, 1913.

Howard, B. F.: The Bureau of Tuberculosis: Its Work and Plans (California), *California State Jour. Med.*, August, 1914.

Report of the Kentucky Tuberculosis Committee, State Board of Health, Frankfort, Ky.

Taylor, H. L.: Advantages of State Control over Tuberculosis Hospital, *Modern Hospital*, July, 1914.

Kress, G. H.: California State Tuberculosis Commission, *California State Jour. Med.*, August, 1912.

Hinsdale, G.: Atmospheric Air in Relation to Tuberculosis, Smithsonian Institution, Washington, D. C., \$1.

A LETTER BY JENNER

To the Editor:—Pasted to the back of the title-page of a book entitled "Professional Anecdotes, or Ana of Medical Literature" (London, 1825, in three volumes, I having Volume II), is an original letter written by E. Jenner. I enclose a copy.

MAX ISENBERG, M.D., New York.

The letter reads:

Cheltenham, Jan. 16, 1807.

Dear Sir.—I congratulate you and Mrs. Phillips on the addition to your flock. It is my intention to be in town soon; but how soon I cannot at the present moment positively say. My movements will be regulated by those of the College of Physicians and the House of Commons. The former have not yet finished their inquiry, which will, when completed, be laid before the House.

This inquiry will lay all those troublesome ghosts which have so long haunted the metropolis with their *ox-faces*, and dismal hootings against vaccination. However, tis all for the best—you may depend upon it the new investigation will prove the touchstone of the vaccine discovery.

I have not yet seen your monthly magazine for the present month. Probably you may not have inserted the very curious and interesting piece of intelligence I recd. from Madrid. This supposition induces me to enclose it. What a glorious enterprize! I have made peace with Spain, and quite adore her philanthropic monarch. Could not this be touched upon by some of those who, *thru' you*, introduce [I cannot decipher the next word] into the world? A word more respecting your little one. Altho' I should be happy to shield it myself from the speckled monster, yet I would advise you not long to wish my coming to town. I will just add that I consider the vaccine lancet in the hand of John Ring, just as safe as in my own.

Pray present my best wishes to Mrs. Phillips and tell her I have not forgotten her civilities.

Yr. very faithful St.

E. JENNER.

LIGHT AUTO FOR PHYSICIAN

To the Editor:—I am seeking information regarding the experience of those who have driven the lighter makes of automobiles. The car I use weighs about 2,000 pounds, and while it gives excellent service as far as speed and power are concerned I find the up-keep expensive as to tires. The country in my section is somewhat rocky and hilly, the territory is rather large and we find a fast car a necessity. Any information I may receive will be much appreciated. Does any one know anything about or use the lately advertised tandem seated cars?

M. J. S., Kansas.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

COLORADO: Denver, October 6. Sec., Dr. David A. Strickler, Empire Bldg., Denver.
DISTRICT OF COLUMBIA: Washington, October 13-15. Sec., Dr. George C. Ober, 125 B St., S. E., Washington.
GEORGIA: Atlanta, October 13-15. Sec., Dr. C. T. Nolan, Marietta.
IDAHO: Wallace, October 6. Sec., Dr. John F. Schmershall, Jerome.
ILLINOIS: Chicago, October 6-8. Sec., Dr. C. St. Clair Drake, Springfield.
KANSAS: Topeka, October 13-15. Sec., Dr. H. A. Dykes, Lebanon.
LOUISIANA: New Orleans, October 29-31. Sec., Dr. E. L. Leckert, New Orleans.
MICHIGAN: Lansing, October 13-15. Sec., Dr. Beverley D. Harison, 504 Washington Arcade, Detroit.
MINNESOTA: Minneapolis, October 6-9. Sec., Dr. Thomas McDavitt, Lowry Bldg., St. Paul.
MISSISSIPPI: Jackson, October 27-28. Sec., Dr. E. H. Galloway, Jackson.
MISSOURI: Kansas City, September 28-30. Sec., Dr. J. A. B. Adecock, State House, Jefferson City.
MONTANA: Helena, October 6. Sec., Dr. William C. Riddell, Helena.
NEW JERSEY: Trenton, October 20-21. Sec., Dr. H. G. Norton, Trenton.
NEW MEXICO: Santa Fe, October 12. Sec., Dr. W. E. Kaser, East Las Vegas.
NEW YORK: September 22-25. Chief of Examination Division, Mr. Harlan H. Horner, Department of Education, Albany.
OKLAHOMA: Muskogee, October 6-8. Sec., Dr. John W. Duke, Guthrie.
RHODE ISLAND: Providence, October 1-2. Sec., Dr. Gardner T. Swarts, State House, Providence.
WEST VIRGINIA: Clarksburg, October 13. Sec., Dr. S. L. Jepson, 81 Twelfth St., Wheeling.

Requires Hospital Intern Year

The annual announcement of the University of Vermont, College of Medicine, just received, states that all students matriculating after Jan. 1, 1915, in addition to the usual four-year course will be required to take a fifth year as an intern in some approved hospital before they are eligible for the degree of Doctor of Medicine. This is the fourth college which has adopted this requirement. The complete list and the session when the requirement became or will become effective are as follows:

	Session of
University of Minnesota Medical School.....	1910-11
Leland Stanford Jr. University School of Medicine.....	1914-15
Rush Medical College (University of Chicago).....	1914-15
University of Vermont College of Medicine.....	1915-16

One state licensing board, that of Pennsylvania, now requires that every candidate to be eligible for a license to practice medicine in that state, must have served at least one year as an intern in an approved hospital. The requirement became effective in 1914.

University Graduate Schools of Medicine.

The annual announcement of the University of Minnesota Medical School, just received, includes information regarding a Graduate School of Medicine. The complete list of university graduate medical schools and their location is as follows:

	Location
University of Alabama, Graduate School of Medicine.....	Birmingham
University of California, Graduate School of Medicine.....	Los Angeles
Tulane University Post-Graduate School of Medicine.....	New Orleans
Harvard University Graduate School of Medicine.....	Boston
University of Minnesota, Graduate School of Medicine.....	Minneapolis

The opening of such schools in this country by high grade universities is very encouraging and gives assurance that graduate medical instruction on a high plane is rapidly becoming more available in this country.

New York Reciprocity Report

Mr. H. H. Horner, chief of the Examination Division of the New York Education Department, reports that 7 candidates were licensed through reciprocity and one candidate on exemption, from January to June, 1914. The following colleges were represented:

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Dunham Medical College, Chicago.....	(1902)	Indiana
Univ. of Mich., Dept. of Med. and Surg., (1910; 2)	(1912)	Michigan
Eclectic Med. Coll. of the City of New York.....	(1912)	New Jersey
Miami Medical College.....	(1908)	Ohio
Medico-Chirurgical College of Pennsylvania.....	(1899)	New Jersey

LICENSED ON SPECIAL EXEMPTION CLAUSES

	Year Grad.	Indorsed Total No.
Jefferson Medical College	(1886)	1

Book Notices

DIE PROGNOSESTELLUNG BEI DER LUNGENTUBERCULOSE mit eingehender Berücksichtigung der physikalischen und serologischen Befunde und der therapeutischen Prognostik. Bearbeitet von Priv. Doz. Dr. D. O. Kuthy und Dr. A. Wolff-Eisner. Paper. Price, \$4.50. Pp. 572, with 21 illustrations. New York: Rebman Company, 1914.

The authors discuss one of the most important questions of medicine, namely, the prognosis of pulmonary tuberculosis. The importance attached to prognosis is indicated by the fact that it is about the first question to be asked by the patient, who values diagnosis chiefly because it enables the physician to predict correctly the outcome of the disease. The former opinion made the question of prognosis depend almost entirely on the correctness of the diagnosis, since a positive diagnosis of pulmonary tuberculosis was held to mean an absolutely unfavorable prognosis. The advance of science showing the frequency of recovery from pulmonary tuberculosis has made this simple prognosis untenable. The diagnosis must be more carefully made to discover conditions which may have favorable or unfavorable influences on the final outcome. The heredity must be thoroughly worked out and the past history of the patient diligently explored for indications. The authors discuss first these historical data. The prognostic significance of sex, age, occupation, financial situation, temperament, etc., are considered. In a similar way, the present condition of the patient is inquired into and the prognostic significance of the individual symptoms and objective findings thoroughly discussed. The authors then take up the effect of various treatments on prognosis, such as the tuberculin treatment in all its forms. Spengler's I. K. is regarded as still on trial but must not, as has been done, be set down as inactive. It is evidently capable, in some cases, of doing harm. It is possible in the space at command only to indicate the scope of the work. To consider critically the various aspects of the subject and the multitude of various questions raised is impossible. The volume is completed by a list of more than a thousand references to the literature. Considering that most of these references are accompanied in the text by brief abstracts of the respective articles, an idea may be gained of the research whose results are embodied in this volume.

A MANUAL OF INFANTILE PARALYSIS WITH MODERN METHODS OF TREATMENT, INCLUDING REPORTS BASED ON THE TREATMENT OF THREE THOUSAND CASES. By Henry W. Frauenthal, A.C., M.D., Surgeon, New York Hospital for Deformities and Joint Diseases, and Jacolyn Van Vliet Manning, M.D. Cloth. Price, \$3. net. Pp. 374, with illustrations. Philadelphia: F. A. Davis Company, 1914.

The authors have here collected a large amount of information concerning infantile paralysis (anterior poliomyelitis)—historical, epidemiologic, etiologic, diagnostic and with reference to its management and treatment—together with a discussion of various theories that have been formulated about it. Interesting are epidemiologic studies of Manning of the Wisconsin epidemics, the statistics with reference to coincident animal paralyses, tables of epidemics and pandemics and the results of animal experimentation. The chapter on differential diagnosis, containing descriptions of the different types of cases, is a valuable one. The considerable portion of the book is devoted to treatment in the acute and preparalytic stages and of the paralyses and deformities resulting from the disease. This is of practical worth to the practitioner as well as to the orthopedist; it

offers definite advice, justified by a large experience in an institution for the treatment of such cases. The high-frequency current is recommended as soon as paralysis has occurred, and other physical measures are emphasized and persistence in their employment insisted on. Especially is it important to employ and persist in measures or exercises which require voluntary effort on the part of the patient, no matter how feeble the response may at first be. Scoliosis, one of the deformities discussed, is attributed to poliomyelitis as the etiologic factor in most instances. Mechanical and surgical measures are set forth, the latter including tendon, nerve and muscle transplantation, though the authors have not much that is new to offer along these lines, and, indeed, insist that the other methods of treatment should first be given the most extended and patient trial. The book is quite satisfactory on account of its definiteness of statement regarding the management of a disease whose sequelae are most deplorable and whose treatment has hitherto not been productive of much success in the way of results.

DAS ULCUS DUODENI. Von Dr. J. Schrijver, Arzt für Magen- und Darmkrankheiten in Amsterdam. Paper. Price, 10 marks. Pp. 184, with 16 illustrations. Berlin: S. Karger, 1914.

The new interest in ulcers of the digestive tract which has followed the investigations of Moynihan and of the Mayo brothers found gastrologists in general, and particularly those of the Continent, rather unprepared for the revelations of the surgical clinic. The profession of England and America readily accepted the new views, especially as to the frequency of ulcer of the duodenum to which Moynihan assigned so characteristic a clinical history, but the clinicians of Germany have been somewhat slow to acquiesce. Schrijver adds his testimony to that of others as finding in a large proportion of cases an ulcer of the duodenum as the cause of chronic dyspepsia from which the patients were happily relieved by timely surgery. His book gives a systematic account of the disease and closes with the histories of a series of thirty-seven cases selected from ninety-five cases occurring in his experience in the last three years. The book is illustrated with a number of plates and several roentgenograms, the latter, however, having an indefiniteness which impairs their utility to most readers.

ABNORMAL PSYCHOLOGY. By Isador H. Coriat, M.D., Second Assistant Physician for Diseases of the Nervous System, Boston City Hospital. Second Edition. Cloth. Price, \$2 net. Pp. 428. New York: Moffat, Yard & Co., 1914.

The whole field of abnormal psychology is undergoing modification, influenced by the introduction of Freud's theories and the psychoanalytic method of study. This new edition of Coriat has been enlarged by some general outlines of Freudian principles. "For reasons of space" and "because such material does not really lend itself to popular presentation" the author does not go into the subject fully. He is evidently troubled by qualms of which some exponents of the newer psychology have not complained. The theory of dreams is explained in simple language, and there is a new chapter on the prevention of the neuroses and a reprinted article on colored hearing. The book has advanced parallel to recent studies in abnormal psychology and is a worthy publication for those especially interested in the subject.

THE PRACTICE OF SURGERY. By James Gregory Mumford, M.D., Lecturer on Surgery in Harvard University. Second Edition. Cloth. Price, \$7. Pp. 1032, with 683 illustrations. Philadelphia: W. B. Saunders Company, 1914.

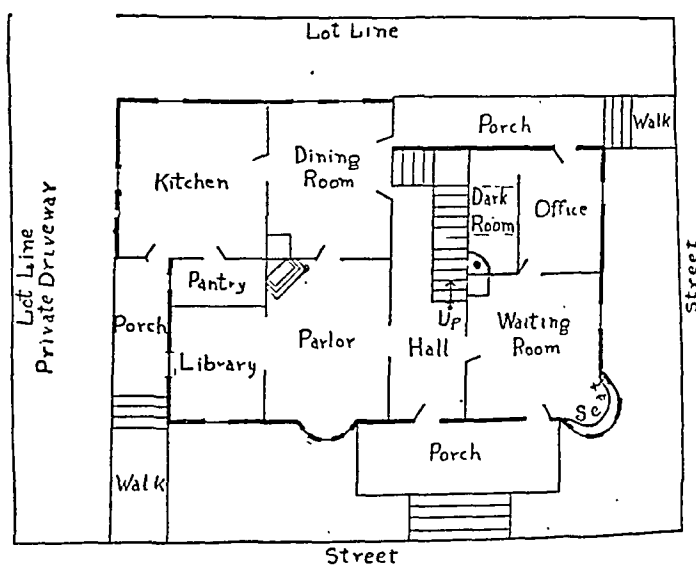
Three years have elapsed since the publication of the first edition of this book. The author has revised the text to keep it abreast of progress, although in the past few years no revolutionary change in surgery has occurred. New cases are cited to illuminate the text and new pictures are added. The book is therefore strictly up to date, and as a clinical surgery cannot fail to prove of value to the reader. The author's style is pleasing, clear, direct and concise in exposition. The many beautiful illustrations are a valuable addition to the text.

Miscellany

A Combined Office and Residence

To the Editor:—My wife and I have been interested in the views and ground-floor plans of physician's offices and residences printed in *THE JOURNAL* from time to time. While many of them are convenient and attractive, we have failed to see one yet that we like so well as ours. I am enclosing a drawing of the first floor plan.

This building was designed by ourselves about twelve years ago, and, since the residence part pleases Mrs. Dunn and the office suits me, there must be many good features about the house as both of us are rather particular. The office has a conspicuous place in the house without relegating the living rooms to the rear, commands a view of two streets and their corner, and is easy of access from the front. The parlor and library both front a street also. The hall separates the two departments of the house from each other entirely. The kitchen is entered by a walk and porch from one street and the dining room by the same arrangements from the other street. The house is built on a lot 67 by 50 feet and the outside dimensions are 50 by 32 feet. The upper story is not shown, as physicians would hardly be interested in this, but I will say that every room upstairs fronts one of



First-floor plan of combined office and residence.

the streets, excepting the bathroom, and all are of good size. While we admit that the house is not built along conventional lines, we believe it has many features that will commend it to the physician planning to build a combined home and office.

JAMES W. DUNN, M.D., Cairo, Ill.

Is Loco-Weed Disease a Myth?

Poisonous properties have long been ascribed to the pretty, luxuriantly blooming leguminous plants known to the Western cattle ranges as loco or crazy weeds. Being hardy and able to maintain themselves in poor soil, these plants, of two or three main types, are found widely distributed from British America to Mexico and from Kansas to California. Stock-raisers have attributed great losses to the disease caused in horses, cattle and sheep by the eating of this weed, and the state of Colorado paid out nearly \$200,000 in bounties for attempts at its extermination between 1881 and 1885.

The theory of Crawford (Crawford, A. C.: Barium, a Cause of the Loco-Weed Disease, Bull. 129, Bureau Plant Ind., U. S. Dept. Agric., 1908. Editorials, *THE JOURNAL*, Feb. 8, 1908, p. 458, Oct. 17, 1908, p. 1338) that barium causes loco poisoning was rejected by Marsh and Alsberg and Black (Marsh, C. D., Alsberg, C. L. and Black, O. F.: The Relation of Barium to the Loco-Weed Disease, Bull. 246, Bureau Plant Ind., U. S. Dept. Agric., 1912. Editorial, *THE JOURNAL*, Dec. 21, 1912, p. 2258) on the grounds (1) that barium poison-

ing does not produce the symptoms typical of "locoed" animals; (2) that antidotes to barium have no effect on loco poisoning; (3) that admittedly harmless plants occupying the same areas as the loco-weed contain barium in comparable quantities, and (4) that the barium found in dried loco-weeds is present in almost insoluble form. These investigators, however, do not question the existence of loco-weed disease; in fact, they claim to have produced it experimentally in horses and cattle. They merely leave the question of its cause an open one.

H. T. Marshall, in a recent article (*A Summary of Studies of Loco-Weed Disease of Sheep, Johns Hopkins Hosp. Bull.*, August, 1914, p. 234), based on studies of the sheep of Montana, begun eleven years ago for the Department of Agriculture, though not published by the department, takes the point of view that the condition designated as loco disease is not a single clear-cut malady. In his experience the descriptions given by various ranchmen of the symptoms and cause of the disease did not tally with each other; and necropsy studies on supposedly locoed sheep from different flocks disclosed different conditions. Some sheep were heavily infected with a liver tapeworm (*Thysanosoma actinioides*), others with the sheep-fly (*Oestrus ovis*). Marshall found the ranges too frequently grazed over and the flocks too large for the available grazing-grounds. In his opinion, all the symptoms attributed to loco poisoning could be accounted for by undernourishment and infections. In an attempt to produce loco disease experimentally, four lots of sheep were segregated. One group was fed abundantly on alfalfa, another on half rations of alfalfa, a third on loco-weed without alfalfa, and a fourth on loco and alfalfa. It was found that the sheep fed on loco-weed without alfalfa suffered from starvation; but those fed on alfalfa and loco kept in better condition and gained more in weight than any of the others. None of the animals receiving loco showed any characteristic symptoms. Sheep-fly disease attacked all the flocks during the course of the experiments. The starved animals suffered most, those fed on loco and alfalfa least. Marshall's conclusions are that there are several diseases masquerading under the name of "loco disease," that the existence of any disease definitely attributable to the loco-weed remains to be proved, and that the interests of Western stock-raisers can be best served, not by a campaign against the presumably innocent loco-weed, but by combating the parasitic diseases prevalent on the ranges, as well as the overstocking of ranches and the underfeeding of stock.

It may occur to the reader that Marshall's experiments and observations appear to indicate that sheep are not susceptible of loco poisoning, but not necessarily to prove that this disease has no existence. Marshall says that he could find no locoed animals other than sheep for study even after extended search on the Montana ranges. It seems regrettable that his experimental work did not include cattle and horses.

Efficacy of Tartar Emetic in Superficial Leishmaniasis

G. Vianna of the Instituto Oswaldo Cruz at Rio de Janeiro relates that in Brazil nothing seems to act so effectively on leishmania lesions of the skin and mucous membranes as antimony and potassium tartrate by intravenous injection. The experiences there with salvarsan and neosalvarsan have been entirely negative as far as curing lesions of this nature in the integument. The efficacy of tartar emetic in trypanosomiasis having been thoroughly established in his experimental and clinical experience, he applied it also in a number of cases of destructive leishmania lesions of the face and nasal mucosa, and gives a series of illustrations "before and after," in his article on the subject in the *Annales Paulistas de Med. e Cir.*, 1914, ii, 167. The maximum dose was 10 c.c. of a 1 per cent. solution of the tartrate in physiologic saline sterilized by filtration. He commenced with small doses and in the chronic cases kept up the smallest doses for a long time. He gave the intravenous injections by this technic even to children of 5 and to patients over 60, and never noticed any untoward by-effects except in two cases of nephritis in which

the albumin increased in the urine and edema developed under the large doses; on reducing the dose no further injury was apparent even in these cases. The symptoms showing that the limit of tolerance has been passed are pains in joints and muscles or headache. In the patient shown before and after treatment, the destructive affection in the nose and larynx was of five years' standing and was accompanied by extensive ulcerative processes on the legs, all completely cured under the antimony and potassium tartrate treatment.

Fundamentals in Teaching Sex Hygiene

Most of the plans for introducing the subject into the home and school insist that the facts of human reproduction should be taught to the child by an indirect method. This indirect method J. C. Hollister (*Cal. State Jour. Med.*, July, 1914) believes to be wrong, because it does not rest on what to his mind are the fundamentals of sex education. The fundamentals are not to be found in general biology or nature study; they are not plant or animal reproduction; they are not cells nor evolution nor life itself. They are human anatomy and physiology. Any plan that does not recognize the truth of this, any plan that does not rest on these foundations, is inherently weak. It is unnatural, illogical, and has not a sound psychologic basis. If this be true, the child should have a knowledge of human anatomy and physiology before it can appreciate the matter in sex education.

Hollister claims that: 1. Human anatomy and physiology can be taught successfully to the young child. 2. The knowledge of normal human anatomy and physiology is particularly advantageous to the child. 3. There are no important reasons why the genital system should not be taught as part of general anatomy and physiology. 4. Such a plan rests on a sound psychologic basis.

An Economic Aspect of Vaccination

In a recent bulletin of the Rochester (N. Y.) Chamber of Commerce appears the following note from G. W. Goler, the health officer:

"You have noticed that it is our intention to temporarily use the small-pox pavilion at our Municipal Hospital for the treatment of drug habitues. One of the reasons for our being able to do this is because our city has been so remarkably free from small-pox that the small-pox pavilion is vacant most of the time. Rochester is unique in that respect, from the fact that a large number of the large employers have refused to employ men unless they have been successfully vaccinated. Now if we could get more firms to insist on vaccination as a prerequisite for employment we might be able to go for a much longer period without cases of small-pox, and thus be able to use our small-pox pavilion for other purposes."

In these days of stringent economy it will be found that the most important economy is the conservation of the public health.

Mistakes and Sins

"We make mistakes; other people commit sins." A wrong diagnosis after due examination (a thing that happens to all of us) is a mistake, and a pardonable one; a wrong diagnosis arrived at without due examination (a thing that happens to the other fellows) is a sin; medically speaking, it is "the unpardonable sin." That an examination was not allowed is no excuse for a wrong diagnosis. If you cannot convince the patient that an examination is necessary, quit the case; for it is better to lose a patient than to lose reputation. Moreover, do not treat first and examine afterward; for then you may be called on to treat, not only the disease, but also the effects of your own treatment. After an examination has been made, if still in doubt, admit it. If you do not know enough about the case to satisfy yourself, it is not safe to assume that you know enough about it to satisfy the patient; this is not only indifferent ethics, but also bad policy. —Arthur E. Giles. *Clinical Journal*.

Medicolegal

Validity of Statute Providing for Licensing of Practitioners of Specialties

(*Bohannon vs. State Board of Medical Examiners et al* (Cal.), 140 Pac. R. 1089)

The District Court of Appeal of California, First District, reverses a judgment which sustained the defendants' general demurrer to the complaint in this action wherein the plaintiff claimed that it was the duty of the defendants, as the Board of Medical Examiners, to issue to him a certificate authorizing him to practice a special branch of medicine and surgery. He based his claim on the amendment of 1911 to the medical practice act which provided in substance that the medical examiners might issue a certificate to any person who had practiced a special branch of medicine and surgery for a period of not less than thirty-five years, fifteen years of which time had been within the state of California. The trial court was of the opinion that the amendment, so far as it provided for special certificates, was unconstitutional, for the reason that the classification was unreasonable. The court of appeal however holds otherwise, and a rehearing has been denied by the Supreme Court of California.

The court of appeal says that the provisions of the act complained of clearly show a legislative intent to admit certain persons to practice a special branch of medicine and surgery who have previously violated the law, not because they have violated the law, but because of an acquired experience in given branches of medicine or surgery. It is conceded that the act of the legislature may not have been the most expedient or salutary, but the courts are not concerned with the good or bad policy exercised by that branch of the government. The only argument against the classification here adopted is that it extends a certain exemption to a particular class who for a certain period have been practicing illegally. Does this illegal practice of itself deprive the legislature of the right to adopt regulations under which the persons in this class as such may gain the right to practice medicine and surgery? This court is of the opinion that the question must be answered in the negative. Moreover, the applicant is not qualified for practice by the number of years of his violation of the law, but he must pass an examination, and in addition thereto give a practical demonstration of his successful practice in a special branch, and even then, if he successfully pass these tests, a right to practice the special branch in which he is experienced and proficient only is conferred on him.

The applicant in this case specified as the "special branch of medicine and surgery" which he desired to practice, "the treatment of cancers, tumors, malignant growths and cutaneous diseases." This court cannot judicially say that these disorders are not so correlated that they cannot be classed as a "special branch of medicine and surgery." This question is a matter for determination by the trial court under competent evidence.

Loss of Eye Due to Infectious Disease

(*McCoy vs. Michigan Screw Co.* (Mich.), 147 N. W. R. 572)

The Supreme Court of Michigan says that several small pieces of steel from the lathe machine on which the claimant was working lodged in his eye. This, it was claimed, caused an irritation and caused him to rub his eye. At the time he was being treated for gonorrhea. Six days after the accident he went to another physician, who removed four pieces of steel from the eye. The next day the physician removed another piece of steel and discovered that the eye had become infected with gonorrhea. The man was then sent to a hospital and subsequently lost the sight of the eye. The industrial accident board affirmed an award made by an arbitration committee of \$6.49 a week for 100 weeks, under the workmen's compensation act. But the decision of the board is reversed by the court, which holds that the facts were not

capable of supporting the inference that the injury arose out of and in the course of the employment. The court says that the claimant contended that the germs would not have entered the eye had not the steel caused "(a) an inclination to rub—the inciting cause—(b) inflamed condition which made the eye susceptible to the entry of the germs, as in the case of blood-poisoning and erysipelas." It was not reasonable to say, however, that he would not have rubbed his eye if the steel had not lodged there. He might not have rubbed his eye, it was true; but it was just as reasonable to suppose that he might have had occasion to rub his eye without this particular inciting cause. By the medical testimony it conclusively appeared that the infection could have taken place if the steel had not been there. It must be said, from this record, that the loss of the eye was directly and immediately due to the infection caused by the gonorrhea, which it could not be claimed was a risk incident to the employment.

Practice of Medicine by Christian Scientist

(*People vs. Cole* (N. Y.), 148 N. Y. Sup. 708)

The Supreme Court of New York, Appellate Division, First Department, affirms a conviction of the defendant of practicing medicine without lawful authorization and registration. The court says that the defendant testified that he had been for eight years an authorized practitioner of the Christian Science Church, and that he had maintained an office in a certain building for five years; that when he received his first knowledge of Christian Science he was a sculptor and a poet; that he had never studied medicine in any way; that his average income from his practice was about \$5,000 or \$6,000; that he did not ask people for money for treating them, but when they tendered it he took it.

The statutory definition of the practice of medicine is broad enough to cover the acts of the defendant because he "holds himself out as being able to . . . treat . . . any human disease," and he did "undertake to treat." The language of the statute is "by any means or method." This covers the means or method used by him. While he denied the material existence of disease and said it was merely mental, yet he undertook to treat people he called patients for what they told him was the matter with them; in other words, what they thought were diseases. He had an office for that purpose; he received fees therefor; he habitually termed what he did his "treatment." He conducted a peculiarly successful business. He called himself a practitioner, but admitted that the popular phrase was healer. Whatever the believers may think about disease, the law regards it as a fact.

The one question presented here was whether the defendant was permitted to do what he did under the clause of the statute which provides that "This article shall not be construed to affect . . . the practice of the religious tenets of any church." Is the commercialized use of prayer for the avowed purpose of treating all persons seeking cure for all kinds of bodily ills the practice of the religious tenets of a church? In this case this court has no right, and does not presume, to pass on the faith, belief or religious tenets of the Christian Scientists or the efficacy of the methods of their practitioners in treating disease or error. Its sole concern is whether on the facts proved the defendant was properly convicted of practicing medicine without being licensed and registered, and whether the conceded acts come within the exception as to the practice of the religious tenets of any church. "Tenet" is defined by the Century Dictionary as "any opinion, principle, dogma or doctrine which a person, school or sect holds or maintains is true." A man's right to hold and express such is unquestioned. But when he advances from the realm of thought to that of action, he must obey the law. The court reaches the conclusion that the acts complained of constitute the practice of medicine, were not the practice of the religious tenets of any church, and to authorize the defendant to administer the treatment, which he conceded he did, he must have first been duly licensed and registered in accordance with the provisions of the public health law.

Society Proceedings

COMING MEETINGS

- Amer. Academy of Ophthal. and Oto-Laryn., Boston, Oct. 19-21.
American Association of Railway Surgeons, Chicago, Oct. 14-16.
Association of Military Surgeons of the U. S., Cincinnati, Sept. 29-Oct. 2.
Delaware State Medical Society, Wilmington, Oct. 13-14.
Idaho State Medical Association, Boise, Oct. 8-9.
Indiana State Medical Association, Lafayette, Sept. 24-25.
Kentucky State Medical Association, Newport, Sept. 23-25.
Minnesota State Medical Association, St. Paul, Sept. 30, Oct. 1-2.
Mississippi Valley Med. Assn., Cincinnati, Oct. 27-29.
Nevada State Medical Association, Reno, Oct. 13-15.
New Mexico Medical Society, Albuquerque, Oct. 5-7.
Pennsylvania State Medical Society, Pittsburgh, Sept. 21-24.
Utah State Medical Association, Salt Lake City, Sept. 29-30.
Vermont State Medical Society, Rutland, Oct. 8-9.
Virginia Medical Society, Washington, D. C., Oct. 27-30.
Washington State Medical Association, North Yakima, Sept. 21-23.
Wisconsin State Medical Society, Oshkosh, Oct. 7-9.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Albany (New York) Medical Annals

August, XXXIV, No. 8, pp. 415-478

- 1 Pathogenesis and Symptomatology of Syphilitic Aortitis. G. Blumer, New Haven, Conn.
- 2 *Spasmodic Closing of Cerebral Arteries in Its Relation to Apoplexy. A. Gordon, Philadelphia.
- 3 Analysis of Deaths Occurring in Course of 1,573 Surgical Operations. E. MacD. Stanton, Schenectady.
2. Spasmodic Closing of Cerebral Arteries.—Gordon has followed up fourteen cases of this character. Six of the patients are still living; eight died and Gordon succeeded in obtaining permission for autopsies. Every one of the patients was seen by him in each attack. A close analysis of both groups of cases demonstrate one common fact that besides embolism, thrombosis and hemorrhage which are considered as the classical causes of apoplectic strokes there is also a condition which is of hemiplegic or hemiparetic character, but which is produced not by a material lesion of the blood-vessel, but by such a functional disturbance of the vessel wall as to interfere with the circulation and therefore with the function of the nerve tissue supplied by this blood-vessel. The temporary character of this disorder of function, the prompt or rapid recovery from the interfered function, finally and especially the intermittence and frequent repetition of the attacks—all these facts speak in favor of a condition which is totally different from a material obstruction of a vessel with an embolus or thrombus or from a hemorrhage. Intermittent closing and opening of the cerebral vessels are in Gordon's opinion, the only possible explanation of the temporary paralysis. Hemorrhage, embolism and thrombosis could not possibly be taken into consideration in the production of brief and intermittent attacks. Diminution or possible avoidance of arterial irritability is the prime factor in the management of cases of this character.

American Journal of Tropical Diseases and Preventive Medicine, New Orleans

August, II, No. 2, pp. 99-153

- 4 *Relationship of Renal Lesions of Asiatic Cholera to Ordinary Nephritis with Special Reference to Acidosis. A. W. Sellards, Baltimore.
- 5 How War Has Been Waged in Mexico against the Mosquito. E. Liceaga, Mexico City.
- 6 Superiority of Intramuscular Injection over Administration by Mouth in Treatment of Malarial Infections by Quinin. S. S. Cohen, Philadelphia.
4. Renal Lesions of Cholera and Acidosis.—Investigation of the ordinary forms of chronic and acute renal disease

have shown that the increase in tolerance to bicarbonate which was found to occur in the uremia of asiatic cholera is not specific for the nephritis of cholera. It occurs not only in nephritis arising from other infections, but also in nephritides which are free from infection. The cause of this increase in tolerance in cholera Sellards believes is almost certainly due to an acidosis; that is, to an impoverishment of the sources of fixed bases in the body. It is conceivable that this deficiency in carbonates is perhaps due to two factors, namely, (1) a diminished excretion of acid on account of the urinary changes; (2) and a loss of alkali directly by the bowel. The conditions in asiatic cholera afford evidence of the inadvisability of distinguishing between relative and absolute acidosis.

The cause of the increased excretion of ammonia in cholera is not known. Two factors must be considered in its explanation namely, (a) the possibility of a primary disturbance of protein metabolism with defective synthesis of urea, and (b) a secondary disturbance of metabolism with an accumulation of ammonia to compensate for an acidosis. The evidences of acidosis in the uremia of cholera are sufficiently definite to constitute a rational basis for treatment of this condition with alkalis. The examination of the urine or the blood affords a rational guide of the amount of bicarbonate to be administered. The available evidence indicates that it is advisable to give a mildly alkaline solution ($\frac{1}{2}$ of 1 per cent. of sodium bicarbonate) early in the course of the disease, before an out-spoken uremia has developed, increasing the quantity if symptoms of uremia appear. As much as 100 gr. of bicarbonate may be required in the course of two or three days. The quantities, which have been recommended in the text-books, Sellards says, are wholly inadequate to restore the body to its normal content in carbonates. Moreover, the dosage is determined without any guide other than the general condition of the patient. The modifications of alkaline therapy for cholera, suggested by Wherry, is unnecessarily intensive. A limited use of the normal carbonate in cholera has led Sellards to believe that it is distinctly dangerous, especially in the early stage of the disease, when the administration of alkaline therapy promises most.

Archives of Pediatrics, New York

August, XXXI, No. 8, pp. 561-640

- 7 Etiology of Whooping-Cough. A. W. Williams, New York.
- 8 Clinical and Sociologic Aspects of Whooping-Cough. J. L. Morse, Boston.
- 9 *Treatment of Whooping-Cough. E. E. Graham, Philadelphia.
- 10 *Vaccine Treatment in Whooping-Cough. W. M. Hartshorn and H. N. Moeller, New York.
- 11 *Use of Blood-Serum of Immunes in Treatment of Malignant Scarletina. W. S. Barker, St. Louis.
- 12 Hemiparesis and Hemiplegia as an Early Symptom in Tuberculous Meningitis. P. S. Chancellor, Chicago.
- 13 Jackstones Impacted in Esophagus. Report of Three Cases. G. M. Coates, Philadelphia.

9. Treatment of Whooping Cough.—The medicinal treatment of pertussis is divided by Graham into two parts: First, drugs or other methods that *per se* have a tendency to lessen the number and severity of the paroxysms. Second, drugs or other methods that are directed to the treatment of the complications of pertussis. To the first an unusual amount of attention has been given; to the second, comparatively little. Among the drugs that *per se* are useful in pertussis is mentioned belladonna. Graham prefers using the tincture, beginning with 1 drop, three times a day, and increasing the daily quantity by 1 or 2 drops until mild physiologic effects of the drug appear, when the increasing of the dose must be cautiously continued.

Antipyrin Graham has never used in the frequent doses so often advised. A single dose at bed-time, or a morning and evening dose has been, in his experience, as much as it was wise to employ. To a child 2 years he gives 2 or 3 grains each night, or morning and night. Bromid of soda, grains v, 3 or 4 times a day, to a child of 3 years, is often of benefit, and codein, trional, heroin, and chloral are often of benefit in allaying cough and inducing sleep. They may be given in a single dose at bed-time, or, if necessary, 2 or 3 times a day.

Quinin has been used in large doses and when so given may reduce not only the number, but also the severity, of the paroxysms. It is not an antispasmodic, and if it produces any effect in these large doses, Graham says, it must be due to some effect on the causal bacillus. Quinin lactate, 10 gm. saline solution, 100 gr. of which $2\frac{1}{2}$ c.c., warm, is injected intravenously, may be used. If given hypodermically into the muscles the effect is favorable, but not as prompt nor as satisfactory as when given intravenously. Hydroquinin has been employed both intravenously and intramuscularly, but its action is more favorable when injected into the vein. A daily dose is given for five or six days, then a dose every second day. No disagreeable local or constitutional symptoms follow either the intravenous or muscular injections. Hydroquinin has been used both intravenously and intramuscularly as a prophylactic with satisfactory results.

From the close study of his own series, as well as many cases seen in consultation in which the vaccine treatment has been used, Graham is convinced that it is a distinct addition to treatment, and is also of more or less use as a prophylactic. In a case of moderate severity in either an infant or an older child, when the number of the paroxysms is small and of a mild character, the vaccine treatment is not necessary, but is often of distinct benefit, in the severe cases, in children of all ages, and its influence as a prophylactic, especially in which infants have been exposed, or in which a frail or possibly tuberculous child has been infected with the pertussis bacillus, should be carefully worked out, and its prophylactic power tested by its use, in a large number of cases.

10. Vaccine Treatment of Whooping Cough.—A review of the literature by Hartshorn and Moeller shows that 1,445 cases have been reported. There is not an universal endorsement of pertussis vaccine. A variety of vaccines are being used without definite knowledge of the bacteriology of the individual cases treated. There is a striking lack of negative reports. Apparently the vaccine is harmless in uncomplicated cases. There has been established no definite standard for dosage or for treatment. The dosage generally has been apparently too small. The course of the disease in the majority of cases reported has not been much under six weeks. Its value as a prophylactic agent is still undetermined. It is generally conceded that the earlier the treatment is given the better the result. The vaccine treatment is worthy of a more extensive trial.

The authors have treated eighteen cases of pertussis with vaccine. They conclude that a certain number of cases will respond favorably to a commercial vaccine. Where a commercial vaccine has not proved successful it would seem desirable to try an autogenous vaccine. The initial dose should be at least 50,000,000 in older children, and this may be doubled at subsequent treatments up to 40,000,000 at five days intervals. Further observations regarding dosage indispensable. A certain number of cases will not respond favorably to a vaccine, and in those it should be continued after a trial of 4 doses. The relative value of the combined vaccine as compared to the single culture vaccine is undetermined. In that the improvement in a few cases was immediate and striking, it seems fair to the authors to suggest but not to recommend, its use.

11. Blood-Serum of Immunes in Malignant Scarlatina.—Barker cites four cases with three recoveries and endorses this method of treatment. As described in one case the procedure adopted was as follows: At 10:30 p. m. (February 10) about $1\frac{3}{4}$ ounces of blood was extracted from the mother's arm. Allowing this to stand, after sterilizing with a little boric acid they were able to secure next morning $1\frac{1}{2}$ drams of supernatant serum, which was injected hypodermically in the child at 10:40 a. m. (February 11). This injection of serum was repeated evening and morning until 4 injections, each between $1\frac{1}{2}$ and 2 drams, were given. The condition of the patient at the time of the blood-serum injection was at its worst—in fact it would have been hard to conceive of how it could have been worse. For twelve hours thereafter no change could be noted. Then it first became

evident that not only was the case not retrograding, but slightly ameliorating. The cold baths were followed by not so rapid and marked return of hyperpyrexia, dyspnea was less agonizing, the reflexes formerly abolished began to assert themselves and coma grew less profound. This improvement by twenty-four hours, after the first injection was very manifest and continued progressively to convalescence. What was worth noting also in the case was the fact that aural and cervical sequela were absent, although both adenitis and otitis of no mild type had been present.

Florida Medical Association Journal, Jacksonville

August, I, No. 2, pp. 33-64

- 14 Quackery, Superstition and Robbery, Ancient and Modern, in Treatment of Disease. W. R. Warren, Key West.
- 15 Cystitis—Symptom. Report of Cases. J. C. Vinson, Tampa.
- 16 Abuse of Curet. J. K. Simpson, Jacksonville.
- 17 Medical Inspection and Education of Schoolchildren Most Probable Solution of Hookworm, Malaria and Other infectious Diseases. J. C. Davis, Quincy.

Georgia Medical Association Journal, Augusta

August, IV, No. 4, pp. 107-135

- 18 Gaseous Edema. H. J. Williams, Macon.
- 19 Present Status of Pediatric Teaching in Sixteen Southern States Forming Southern Medical Association. C. A. Rhodes, Atlanta.
- 20 Cacodylate of Soda. J. T. Stukes, Americus.
- 21 Diagnosis of Pellagra. G. M. Niles, Atlanta.
- 22 Sanitary Disposal of Human Waste. T. A. Mann, Brunswick.
- 23 Case of Morbus Ceruleus in an Adult. J. E. Sommerfeld, Atlanta.
- 24 *Experience with Anoci-Association Anesthesia. E. C. Davis, Atlanta.

24. Abstracted in THE JOURNAL, May 2, p. 1428.

Journal of Nervous and Mental Disease, Lancaster, Pa.

August, XLI, No. 8, pp. 489-552

- 25 *Paralysis Agitans Syndrome with Syphilis of Nervous System. C. D. Camp, Ann Arbor, Mich.
- 26 *Epilepsy Chiefly from Roentgenologic Standpoint. T. M. T. McKennan, G. C. Johnston and C. H. Henninger, Pittsburgh.
- 27 Spasmodic Closing of Cerebral Arteries in Relation to Apoplexy. A. Gordon, Philadelphia.

25. Paralysis Agitans Syndrome with Syphilis.—A study of the spinal fluid of cases of paralysis agitans has been made by Camp. In ten cases, typical in all respects, it was normal. The cell count in all cases averaged under four, the globulin and albumin were not increased and reducing substance was present. Six of these patients received intravenous injections of neosalvarsan. One patient, age 45, having the disease about two years claimed that the tremor was lessened that his appetite was better and he had less stiffness; objectively, there was a slight lessening of the rigidity but the characteristic tremor persisted. In two other cases there was an improvement subjectively but no objective change. One patient developed severe nausea and vomiting after the second injection and refused further treatment. In two the treatment had no effect whatever. Camp states that a typical Parkinson syndrome may coexist with and be caused by a syphilitic lesion in the central nervous system but that this is not the etiology of the disease paralysis agitans and, furthermore, that any lesion in the central nervous system causing a Parkinson syndrome is likely an irritative rather than destructive one.

26. Epilepsy Chiefly from Roentgenologic Standpoint.—Ninety-five cases have been studied by the authors. Seven of these cases were found to be pituitary tumors, and in only one of these was there any other evidence of involvement of the pituitary gland aside from the epileptic attacks. In these tumor cases there was no local bony thickening at the base of the skull, in fact local thinning of the body of the sphenoid or the clinoid processes from pressure was found almost constantly. In sixteen cases there was local thickening of bony tissue that was confined to enlargement alone of the clinoid processes, or to thickening in the anterior fossa of the base of the skull. In 22 cases the local bony change was found in two situations, namely, the clinoid processes and the base of the anterior fossa. In 35 cases there were bony changes in three situations, namely, the clinoid processes, the

anterior fossa and the body of the sphenoid bone. In these cases there is an appearance of thickening along the entire base of the skull. In 15 cases no bony alterations were found.

An analysis of these latter cases shows that six gave clinical evidence of being cerebropathies; two gave clinical evidence of being paresis. One case showed a calcareous degeneration in the center of the pituitary region. One case showed on the roentgenogram that it was a case of internal hydrocephalus. In one case the picture was taken one week after the first attack. In another case, six months after the first attack. The three remaining cases had been epileptic from three to five years with infrequent attacks.

In the first class of cases, namely, in which the clinoids alone were involved or the base of the anterior fossa alone was involved, the average length of time of the existence of the epilepsy was five and a half years. In these cases 14 per cent. showed frequent attacks, as often as once in two weeks. In the second class of cases, namely, with changes in the clinoid processes and the base of the anterior fossa, the average length of time of existence of the epilepsy was seven and a third years. Twenty-five per cent. of these cases had frequent attacks. In the third class, namely, with changes in three places, the average length of time of existence of the epilepsy was four and two-third years. Sixty-six and $\frac{2}{3}$ per cent. of these cases had frequent attacks. It would seem evident, therefore, that frequency of attacks has more to do with producing local bony changes than the length of time of existence of the epilepsy. Age does not appear to signify as far as bony changes are concerned. For instance, 1 patient, 5 years of age, exhibited all the features, whereas 1 patient, 56 years of age, showed only one feature.

In the examination of an equal number of roentgenograms in which there was no history of epilepsy, 4 were found with marked clinoids, 2 with a thick anterior fossa, 2 with two features and 1 with three features, about 10 per cent. of alteration, whereas leaving out the cases of tumor the percentage of bony changes found in the epileptics is 80. Only 2 plates showed the three features markedly in cases in which there was no history of epilepsy. It would seem probable from these observations, that the bony changes in epileptics are found only in the so-called essential or idiopathic epilepsy. To sum up: The authors found a condition of local acromegaly in essential epilepsy, which they believe can only be due to venous stasis. This stasis can only come in one way, namely, from pressure within the box-like structure that contains the pituitary gland. The evidence appears to be in favor of a crippling of this gland by pressure. Hypopituitarism would consequently be the result. It is known that epilepsy accompanies this condition. Therefore, it would appear that so-called idiopathic or essential epilepsy is due to a mechanical injury of the pituitary gland.

Kentucky Medical Journal, Bowling Green

August 15, XII, No. 15, pp. 475-508

- 28 Every-Day Orthopedics. W. O. Humphrey, Louisville.
- 29 Indications for Cerebral Decompression. G. A. Hendon, Louisville.
- 30 Diagnosis and Relief of Genito-Urinary Affections. D. Y. Keith, Louisville.
- 31 Phases of Anesthesia. J. A. Kirk, Louisville.
- 32 Surgical Treatment of Cancer. R. L. Ireland, Louisville.
- 33 Two Cases of Puerperal Eclampsia. H. L. Read, Louisville.

Laryngoscope, St. Louis

August, XXIV, No. 8, pp. 709-772

- 34 Orbital Approach to Cavernous Sinus. H. P. Mosher, Boston.
- 35 Freezing Interior Turbinate. H. S. Gradle, Chicago.
- 36 Submucous Operation for Correcting Nasal Deformities. N. P. Stauffer, Philadelphia.
- 37 Nystagmus Through Closed Eyelids. E. P. Fowler, New York.
- 38 Operative Treatment of Meningitis. S. J. Kopetzky, New York.
- 39 Proper Fields of Medicine and Surgery in Diseases of Upper Air Passages. J. A. Thompson, Cincinnati.
- 40 Air We Breathe. T. Hubbard, Toledo, Ohio.

Michigan State Medical Society Journal, Grand Rapids

September, XIII, No. 9, pp. 515-572

- 41 *Abderhalden's Sero-Enzyme Test for Syphilis. H. R. Varney and P. F. Morse, Detroit.
- 42 Gastro-Enterology and Its Problems. B. R. Corbus, Grand Rapids.

- 43 *Use of Omentum in Abdominal Drainage. L. S. Ramsdell, Manatee.
- 44 Suggestions in Purchasing and Dispensing of Drugs by Physicians. E. H. Foust, Ithaca.
- 45 Ectopic Gestation with Rupture into Large Bowel—Report of Case. J. A. Attridge, Port Huron.
- 46 Case of Marked Indicanuria in Psychopathic Patient. J. H. Agnew, Ann Arbor.
- 47 Case of Hydrocephalus. A. H. Beifeld, Ann Arbor.
- 48 Prognostic Value of Functional Test of Kidneys in Case for Prostatectomy. K. M. Scott, Ann Arbor.

41. Abderhalden's Syphilis Test.—On the basis of observations made in 75 cases, Varney and Morse claim that the specificity of the Abderhalden technic applies to syphilis. Syphilites have in their blood-serum enzymes which react with the protein of the organism. Tissue derived from active human lesions are more specific than syphilitic tissue of the rabbit. Mixed infection in the human lesion gives rise to error in mixed infections as shown in their cases of sinus disease, furunculosis, etc. Further work will be required to determine whether all syphilites have the power of developing ferment and at what stages of the disease the test is present or absent.

The authors believe that polyvalent antigens prepared from several stains of pure culture of the spirochetes offer the best hope for further success with this technic. The degree of the success with the test varies in proportion to the care and precision exercised in its execution. No matter how carefully the material is prepared or the test carried out, this method does not by any means approximate the Wassermann reaction for practical usefulness.

43. Use of Omentum in Abdominal Drainage.—Tucking the omentum around the infected area and securing by a stitch or two with fine gut, either to itself in such a way it will stay *in situ*, or often by putting a stitch from the omentum through the lower portion of the infected mass, being careful not to puncture into an abscess cavity, is the safeguard adopted by Ramsdell. When the omentum is not available he often uses the parietal peritoneum in the same way, so that any free pus that may be liberated will lodge outside the abdominal cavity. The procedure protects the rest of the abdominal cavity from free pus which would result in general peritonitis or secondary abscesses. It requires less packing and handling of bowels, which is always desirable. It requires a smaller incision and assures better and quicker drainage. It does away with too large a drain and localizes any secondary hemorrhage. It causes less liability to the formation of undesirable adhesions which would later cause functional disturbances.

New Orleans Medical and Surgical Journal

August, LXVII, No. 2, pp. 95-210

- 49 Early Cases of Bubonic Plague in New Orleans. H. W. Wade and H. L. Staring, New Orleans.
- 50 Value of Gibson Chart in Diagnosis and Prognosis of Acute Intra-Abdominal Affections. F. B. Gurd, Montreal.
- 51 Death during Tonsillectomy from Reflex Inhibition. H. Dupuy, New Orleans.
- 52 Case of Trichono-Cardiasis Rubra. F. M. Johns, New Orleans.
- 53 Roentgen Examination of Digestive Tract. A. Henriques, New Orleans.
- 54 Treatment of Early Tubal Pregnancy. Report of Case. W. Kohlmann, New Orleans.
- 55 Hexamethylenamin in Urologic Therapy. H. W. E. Walther, New Orleans.

Old Dominion Journal of Medicine and Surgery, Richmond, Va.

August, XIX, No. 2, pp. 41-75

- 56 Early Diagnosis and Prevention of Tuberculosis as Factors in Public Health Work. J. J. Lloyd, Jr., Catawba Sanatorium.
- 57 Defects and Diseases in Schoolchildren and Their Significance. N. T. Ennett, Richmond.
- 58 Purpura Hemorrhagica. J. M. Hutcheson, Richmond.
- 59 Hypopituitarism. J. M. Tompkins, Richmond.

Ophthalmology, Seattle

July, X, No. 4, pp. 591-686

- 60 Neurology of Fusion Faculty. J. F. Burkholder, Chicago.
- 61 Chorioidal Sarcoma. G. O. Ring, Philadelphia.
- 62 Melanosarcoma of Chorioid. D. W. Wells, Boston.
- 63 Efficiency of Eye under Different Systems of Lighting. C. E. Ferree, Bryn Mawr, Pa.

- 64 Causes of Far-Sightedness, Long-Sightedness and Cataract. F. Schanz, Dresden.
- 65 Examination for Color Blindness by Lantern Tests. G. H. Taylor, Sydney, New South Wales, Australia.
- 66 Sympathetic Ophthalmia. Report of Three Cases. W. Pyle, Jersey City, N. J.
- 67 Operation for Ptosis. J. H. Claiborne, New York.
- 68 Crossed Cylinders: Are They Scientific Aid in Refraction? E. L. Kniskern, Centralia.
- 69 Unusual Case of Ophthalmic Migraine. E. W. Alexander, San Francisco.
- 70 Auto-Intoxication and Eye Diseases. C. W. Hawley, Chicago.

Surgery, Gynecology and Obstetrics, Chicago

September, XIX, No. 3, pp. 303-426

- 71 *Fate of Transplanted Bone and Regenerative Power of Its Various Constituents. D. B. Phemister, Chicago.
- 72 Intravenous Ether Anesthesia. H. Kümmell, Hamburg-Eppendorf, Germany.
- 73 Results of Operation (Laryngofissure) for Intrinsic Cancer of Larynx. E. Schmiegelow, Copenhagen, Denmark.
- 74 Typhoid Perforation. G. E. Armstrong, Montreal.
- 75 Suture of Levator Ani Muscle in Perineorrhaphy Operations. H. Jellett, Dublin, Ireland.
- 76 Hyperthyroidism: Results of Operation. C. H. Mayo, Rochester, Minn.
- 77 *Origin and Nature of Fetal Movements. E. A. Graham, Chicago.
- 78 Mastitis Lactantia. A. B. Keyes, Chicago.
- 79 Chronic Perforation of Peptic Ulcer. Report of Four Cases. J. R. Verbrycke, Jr., Washington, D. C.
- 80 *Observations of Inguinal Lipomata Based on One Hundred and Fifty-Four Herniotomies. K. Speed, Chicago.
- 81 Concerning Formation of New Vagina in Case of Congenital Vaginal Malformation. G. Schubert, Beuthen, Upper Silesia.
- 82 Results of Neglected Chronic Intestinal Stasis. A. C. Jordan, London.
- 83 Recent Experiments Defining Dangers of Anesthesia. Y. Henderson, New Haven, Conn.
- 84 *Gonococcus Complement-Fixation Test Employing Specific and Non-Specific Antigens. B. A. Thomas, R. H. Ivy and J. C. Birdsall, Philadelphia.
- 85 Vesico-Uterine Transposition. T. J. Watkins, Chicago.
- 86 *Roentgen Diagnosis of Duodenal Ulcer. A. W. George and I. Gerber, Boston.
- 87 Open Method in Reduction of Fractures. W. R. MacAusland, Boston.
- 88 Roentgenographic Diagnosis of Prostatic Enlargement by Means of Air Inflation of Bladder. A. Hyman and L. Jaches, New York.
- 89 *Woven Catgut Splints for Open Treatment of Fractures. D. C. Straus, Chicago.
- 90 Surgical Treatment of Complete Prolapse of Uterus. E. Novak, Baltimore.
- 91 Hemostasis: Its Employment in Surgery of Brain. C. E. Dowman, Jr., Birmingham, Ala.
- 92 Malignant Disease of Retained Testicle. Report of Case. A. P. Butt, Davis, W. Va., and A. Arkin, Morgantown, W. Va.
- 93 Surgical Helps. G. P. Coopernail, Bedford, N. Y.
- 94 Two-Eyed Aneurysm Needle. G. T. Tyler, Greenville, S. C.

71. Fate of Transplanted Bone.—Basing his observations on a large number of experiments, Phemister states that osteogenesis in bone repair occurs from the inner layer of the periosteum, from the endosteum, and to a much less extent from bone-cells and the fibrous content of the haversian canals. Viability of the cells of the transplant is dependent largely on their ability to get nutrition and to some extent on their degree of cell specialization. Periosteum and endosteum, being superficially located, receive sufficient nutrition to survive and proliferate. The great mass of bone-cells being away from the surface and surrounded by an extensive and difficultly permeable calcified matrix gradually undergo necrosis and absorption. A few about the periphery and lining the larger vascular spaces as well as the fibrous elements of the latter may survive and proliferate. Blood-forming cells of the marrow, despite their favorable nutrition and probably because of their greater degree of specialization, gradually undergo necrosis. The subsequent changes which the transplant undergoes depend on its composition and location.

Transplantation into a bony defect: Functional demand stimulates the surviving cells of the transplant to osteogenesis. Callus forms at either end which helps unite the transplant and the fragment. Creeping substitution of the dead cortex gradually occurs by the ingrowth of capillaries with dilatation of the haversian and Volkmann's canals, absorption of the old bone, and deposition of new bone in its place. When periosteum and endosteum are left on, the

transplant contains the greatest number of living osteogenic cells. Consequently, union between the ends and substitution of the dead cortex occurs most constantly and rapidly. When periosteum is removed, osteogenesis producing union and substitution occurs from the endosteum and few surviving cells of the cortex, but the process is much slower than when periosteum is left on. When both periosteum and endosteum are removed, new bone formation from the few surviving cells is slight, and union with the ends of the fragments and substitution of the dead bone are very much delayed. If such a transplant is cut into small pieces before implantation more cells survive because of the increase in surface and facilities for nutrition and greater functional irritation. Consequently, considerable callus forms from each piece and, fusing with that from the others and from the ends of the shaft, rapidly restores the continuity of the shaft. Ossification of the callus proceeds from the surface of each piece and substitution of their dead portions gradually occurs. Periosteum transplanted into ulnar defects and in subperiosteal ulnar resection failed to regenerate bone and restore the shaft, but in subperiosteal resections with reimplantation of cortex either alive or after boiling it formed a layer of callus about the reimplanted portion. Subperiosteal resection of the humeral shaft in the young was followed by regeneration of the shaft. Periosteum gets its chief impulse for osteogenesis not from any injury to itself but from the injured bone to which it is attached or intimately related and which demands repair.

Transplantation into soft parts: The same portions survive as in a bony defect but since there is no functional demand for bone in this location little proliferation or substitution occurs and the transplant is gradually absorbed. Transplanted periosteum produces little or no new bone for the same reason. The presence of an infection, if severe, results in death and failure of the transplant; if mild, there is set up in it an osteomyelitis with excessive proliferation and absorptive changes, but the transplant takes and is functionally a success. The details of all the experiments are given by Phemister.

77. Origin and Nature of Fetal Movements.—All Graham's experiments were made with guinea-pig far advanced in pregnancy. The method adopted for direct observation of the fetal movements has been opening the uterus but leaving the membranes and placenta attachment undisturbed. The methods used to produce asphyxia of the fetus have been: (1) ligation of uterine vessels, (2) occlusion of the trachea of the mother, (3) direct inhalation of CO₂ by the mother. In all the experiments which involved opening of the abdomen a light ether anesthesia was maintained throughout; and the animals were killed with ether at the close of the experiments without being allowed to regain consciousness.

Graham found that asphyxia of the fetus of sufficient grade will result in the production of fetal movements, more or less severe. The movements thus produced vary from mere attempts at respiration, sometimes resembling the fetal hiccup of Mermann, to more muscular contractions, simulating the general convulsions of CO₂ poisoning seen in the adult. At times these are sufficiently violent to be seen through the abdominal wall as distinct shocks. All of the generally recognized varieties of fetal movements, except those concerned with swallowing and sucking, have been produced experimentally by methods which induced an asphyxia of the fetus. The intra-uterine respiratory efforts are not accompanied by an aspiration of any appreciable quantity of fluid into the lungs and hence are not incompatible with life after birth. The explanation of this is not clear, but probably the contact of the skin with the air is an important factor in opening up the respiratory passages. The hypothetical intra-uterine rhythmic respiratory movements of Ahlfeld (*physiologische intra-uterine Athmungsbewegungen*) were not observed. The suggestion is made that the various active movements of the fetus experienced by many pregnant women in the latter part of pregnancy are expressions of a more or less severe, but usually transient, asphyxia of the fetus.

80. Inguinal Lipomata.—Of 154 herniotomies performed by Speed, lipomata were found present in the opened canal 73 times, giving a percentage of 47.4.

84. *Gonococcus Complement-Fixation Test*.—Reviewing the results of their work to date with especial reference to a study of specific versus non-specific antigens to be reported in detail in a later communication, the authors have deduced the following facts: 1. Very rarely have polyvalent antigens prepared from meningococci, pneumococci, streptococci, staphylococci, colon bacilli or cornybaacteria sufficed to fix complement. This does not jeopardize the specificity of the gonococcus antigen, since it is explained on the basis of supervention of a mixed infection. 2. In 10 per cent. of serums examined a weakly positive result was obtained with polyvalent *Micrococcus catarrhalis* antigen; in these cases the reaction was much more marked with the various gonococci antigens. Thus it may be inferred that the association between the gonococcus and the *M. catarrhalis* is not positively and absolutely defined; and it is not unlikely, on the other hand, that a culture of the *M. catarrhalis* is occasionally included in a supposedly specific polyvalent gonococcus antigen, while on the other it is undoubtedly true that a mixed infection, often due to the *M. catarrhalis*, exists in patients suffering from gonorrhea and its complications.

3. A negative gonococcus fixation test does not necessarily mean that the patient is not infected with the gonococcus; in a primary uncomplicated acute case the authors have never observed a positive reaction prior to the sixth week, nor have they obtained positive reactions in which the anterior urethra or vagina alone were involved. 4. A positive result apparently is more specific than the Wassermann reaction, since thus far the authors have found no disease other than gonorrheal in which a positive result was obtained. 5. A positive reaction has been discovered in 21 per cent. of patients supposedly clinically cured; such patients, therefore, should not be discharged from treatment or observation until a negative response is obtained, provided the patient has not been the recipient of immunotherapy. Thirty-three per cent. to 75 per cent. of patients with chronic posterior urethritis, prostatitis, and seminal vesiculitis, with recurrent exacerbations, demonstrate a positive reaction. Sixty-six per cent. of all stricture cases have shown a positive result. 8. Approximately 100 per cent. of cases of active epididymitis or arthritis, at least by the fifth week, have demonstrated a positive gonococcus complement-fixation reaction. The test has proved of value in gynecology in the differential diagnosis of various pelvic inflammatory diseases from one another and from neoplastic formations; also in the differentiation of certain acute and chronic arthritides. Sociologically, the gonococcus complement-fixation test seems destined, along with the Wassermann, to play an important rôle in the future in determining the matrimonial fitness of candidates.

86. Roentgen Diagnosis of Duodenal Ulcer.—Of 82 operated cases of duodenal ulcer an exact diagnosis was made by George and Gerber in 78 cases. In 3 cases duodenal ulcer was reported, but there were minor errors and diagnosis. In 1 case there was a complete failure of diagnosis. Of 150 patients operated on in whom a negative roentgen diagnosis was made, duodenal ulcer was not found in any case. In 1 necropsy a duodenal ulcer was found, in which the previous report had been negative.

89. Woven Catgut Splints for Treatment of Fractures.—Straus uses catgut woven in the form of a rug with long fringed ends, the rug to be just a little shorter than the circumference of the bone, and the fringed ends to be used to tie the rug about the bone as a splint. These ends when tightly tied stretch the rug about the bone, holding it firmly in place. The idea has been carried out in a number of experiments on dogs. The splints have been made of rough German catgut No. 4 and No. 5. The raw gut has been given to an expert oriental rug weaver, who weaves it on a hand-loom, the gut being wet during the process of weaving to soften it so that it is possible to make a very

closely woven rug. The rugs are long enough to encircle the femur of a large dog, and are so woven that the length of the rug can easily be reduced to exactly fit any bone of a smaller circumference. This is of great practical importance and is accomplished by having the strands that run the long way of the rug (the warp) consist of separate fibers, while the cross fibers of the rug (the woof) are made of one long, continuous strand of gut which is alternately woven over and under the long parallel strands. To shorten the rug, to fit any given bone, it is only necessary to cut one end of this cross-strand free, unravel a sufficient amount, and then tie the free end again. Thus in human work it would be necessary to have only two sizes of rugs, one for large bones (femur, humerus) and one for small bones (radius, ulna). When the finished rug is dry it is cut from the loom and is ready to be sterilized. This has been done by the Bartlett iodine method only.

The bone ends are exposed by a free linear incision and the muscles gently separated from the bone; the catgut rug is then introduced around the bone, care being taken not to injure or displace the periosteum. Being sure that the line of fracture is at the center of the splint, begin tying the two opposite free ends of each of the longitudinal strands of the rug. If it seems desirable to reinforce the splint, the free ends after having been tied are long enough to make it possible, after having tied the first series of suture ends to carry the free ends around the tied splint and tie each pair of ends again over the original row of knots, so as to thus double the thickness of the splint. When all the strands have been tied and cut, the soft parts are united over the bone with No. 0 plain catgut, the fascia and skin each similarly closed, and the limb put up in a plaster cast, which is left in place for three or four weeks. The result in the ten dogs on which this procedure has been tried have been encouraging. However, with the splints as they have so far been used there is some interference with external callus formation, the only apparent external callus being just beyond either end of the splint in the form of a collar of callus; the internal and intermediary callus seem well developed. There have been three cases of non-union. One was due to local infection. The second was in a dog that died from an infected struma. The third was in a dog that contracted the mange and was killed. No trace of the splint is to be seen at the end of three weeks and no inflammatory reaction seems to be produced by the presence or absorption of the splint, except in a few cases in which a serous oozing occurred soon after the operation. This ceased shortly, however, and the healing was *per primam*.

United States Naval Medical Bulletin, Washington

July, VIII, No. 3, pp. 357-540

- 95 Economy and Waste in Naval Hospitals. E. M. Shipp and P. J. Waldner, U. S. Navy.
- 96 New Method of Physical Training in U. S. Navy. J. A. Murphy, U. S. Navy.
- 97 Study of Etiology of Gangosa in Guam. C. P. Kindleberger, U. S. Navy.
- 98 Unreliability of Wassermann Tests Using Unheated Serum. E. R. Stitt and G. F. Clark, U. S. Navy.
- 99 Laboratory Note on Antigens. G. F. Clark, U. S. Navy.
- 100 Prevention of Mouth Infection. J. Head, Philadelphia.
- 101 Medical Department at General Quarters and Preparations for Battle. A. Farenholt, U. S. Navy.
- 102 Bacteriologic Index for Dirt in Milk. J. J. Kinyoun, U. S. Navy.
- 103 Brief Description of Proposed Plan of Fleet Hospital Ship, Based on Type Auxiliary Hull. E. M. Blackwell, U. S. Navy.
- 104 Diagnostic Value of Cutaneous Tuberculin Test in Recruiting. E. M. Brown, U. S. Navy.
- 105 Sanitary Mess Table for Hospitals. F. M. Bogan, U. S. Navy.
- 106 Suggested Improvement of Navy Scuttle Butt. E. M. Blackwell, U. S. Navy.
- 107 Malaria Cured by Neosalvarsan. F. M. Bogan, U. S. Navy.
- 108 Case of Rupture of Bladder with Fracture of Pelvis. H. F. Strine and M. E. Higgins, U. S. Navy.
- 109 Use of Succinimid of Mercury. T. W. Reed, U. S. Navy.
- 110 Points in the Post-Mortem Ligation of Lingual Artery. O. J. Mink, U. S. Navy.
- 111 Wounded at Vera Cruz. H. F. Strine and M. E. Higgins, U. S. Navy.
- 112 Case Reports from Naval Hospital, Portsmouth, N. H. F. M. Bogan, U. S. Navy.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

August 22, II, No. 2799, pp. 349-384

- 1 Evolution of Shockless Operation. (Anoci-Association). H. M. W. Gray.
- 2 Opium and Omnipon. H. Sahli.
- 3 Treatment of Wounded in Naval Warfare. D. W. Hewitt.
- 4 Hygiene of Reading and Near Vision. J. H. Parsons.
- 5 Teaching of Ophthalmology. A. M. Ramsay.
- 6 Case of Disseminated Sclerosis Treated by Inoculation. H. L. Smith. Clinical Report. T. G. Stewart.

Journal of Pathology and Bacteriology, London

July, XIX, No. 1, pp. 1-138

- 7 Histology of Some Lesions Present in Pneumonic Plague. W. Lien-Teh and G. S. Woodhead.
- 8 *Cytology of Blood in Passive Immunity. J. S. C. Douglas.
- 9 *Excretion of Urinary Solids: Urine in Nephritis of Scarlet Fever and Diphtheria. J. P. Kinloch.
- 10 Employment of Fat Stains for Differentiation in Preparing Museum Specimens. R. H. Malone and L. Heddick.
- 11 Differential Staining of Fats. E. T. Bell.

8. Cytology of Blood in Passive Immunity.—Evidence is adduced by Douglas that in rabbits, as in man, the leukocytes are more numerous at 2 p. m. than at either 10 a. m. or in the evening, and that this is independent of the time of feeding. The increase in the number of leukocytes in man was proportionately the same at noon and at 3 p. m. when an artificial leukocytosis was produced. The introduction of horse-serum subcutaneously into man produces no change in the amount of hemoglobin or in the number of red cells, but produces a leukocytosis.

The injection of antitoxin in man produced no specific recognizable alteration in the cytology of the blood, the rate of the rise and of the fall in the leukocytes being the same whether a normal or an antitoxic serum was injected. The introduction of antimicrobial (antistreptococcic) serum was followed by an absence of any leukocytosis in the case of man. This probably depends on a failure of the body to respond with a leukocytosis to an injection of serum which follows a series of previous ones, each of which has succeeded in producing such a change, comparable to the failure in the power of antibody formation described by Axel Jørgensen after repeated daily inoculations of antigen, the two phenomena being possibly closely related.

The varieties of cells taking part in the leukocytosis as a response to serum injections in the case of man are (1) the polymorphonuclear and the eosinophilous group, and (2) the transitional and large mononuclear group, no change being demonstrable in (3) the lymphocyte group or (4) the mast cell group. No change could be detected in the hemoglobin percentage or in the numbers of red corpuscles in rabbits as the result of injecting rabbit-, goat- or horse-serums, whether normal or containing antibodies, by whatever route they were introduced.

No change could be demonstrated in the numbers of leukocytes in rabbits as a result of the introduction of rabbit- or goat-serums, whether normal or containing agglutinin, by whatever route they were injected, while a leukopenia may be found to follow the introduction of horse-serums, whether normal or containing antibodies. No evidence has been found that the antibodies as such have any influence on the cytology of normal blood in the case of either man or rabbits.

9. Excretion of Urinary Solids.—Kinloch found that a typical diminution in the quantity of urine occurs in the glomerular nephritis of scarlet fever and diphtheria, and this diminution is present at the very commencement of nephritis. In the pure forms of interstitial nephritis in scarlet fever and diphtheria, no diminution of urine occurs other than can be explained by the elimination of an extra amount of water by the lungs and skin in the presence of pyrexia. In the glomerular nephritis of scarlet fever, nitrogen is diminished both in percentage constitution and in daily output during the acute period of the illness. In the glomerular nephritis of diphtheria, no initial percentage diminution occurs. In the interstitial nephritis of scarlet fever and diphtheria,

nitrogen is freely eliminated from the onset, and this continues throughout the nephritis.

An immediate and long-continued diminution of chlorin occurs in glomerular nephritis in scarlet fever. The elimination of chlorin is free and regular in the interstitial nephritis of scarlet fever. A diminution of chlorin occurs at the onset of glomerular nephritis in diphtheria, and with the early diuresis the chlorin output is at once increased. The output of chlorin is free in the interstitial nephritis of diphtheria when uninfluenced by diet or pyrexia.

The daily output of phosphorus in the whole series of cases is commonly low. No general ratio between the output of nitrogen and sulphur can be determined. In the glomerular nephritis of scarlet fever and diphtheria the daily output of ethereal sulphates is commonly large in the acute stage of the nephritis.

The examination of the urine in various forms of nephritis indicates certain functions of the kidney. The glomerulus normally passes out by far the greater part of the water of the urine. This action of the glomerulus is in great part destroyed in glomerular nephritis. The glomerulus may excrete a larger proportion of nitrogen than has hitherto been assumed. This would explain the diminished nitrogen percentage and daily output in the acute period of glomerular nephritis in scarlet fever in which the glomerular lesion is extensive. The retention of nitrogen might, however, be explained by supposing that it is dependent on secondary body changes resulting from the renal disease. A special secretory function is to be attributed to the glomerular epithelium in order to explain the excretion of chlorids. This is well shown in the glomerular nephritis of scarlet fever, in which the diminished chlorid phase continues in the presence of free urinary excretion, with augmented diet, and in the absence of pyrexia. The excretion of chlorids follows a definite course in each type of nephritis.

The glomerulus appears to have little effect on the excretion of phosphates. With increased diuresis in glomerular nephritis the percentage of phosphates in the urine tends to be diminished, and the total daily output tends to be increased. The glomerulus excretes sulphates independently of the excretion of nitrogen. This is found early in the glomerular nephritis of scarlet fever in which a high percentage of sulphur accompanies a low percentage of nitrogen. In cases of nephritis in which nitrogen is freely eliminated from the first, a high sulphur output accompanies the high nitrogen excretion. The excretion of nitrogen appears to be unaffected by the degenerative changes found in the tubular epithelium.

Reabsorption of chlorids in the renal tubules does not explain all the variations of chlorid excretion. The lesions found in the cells of the convoluted tubules in interstitial or glomerular nephritis do not appear to influence the excretion of phosphates. Any reabsorption in the renal tubules has not been shown definitely to influence the percentage or total daily output of phosphates and sulphates.

Lancet, London

August 22, II, No. 4747, pp. 481-536

- 12 Heredity in Man. W. Bateson.
- 13 *Diagnostic Value of Complement Fixation Reaction in Tuberculosis. J. McIntosh, P. Fildes and J. A. D. Radcliffe.
- 14 Sepsis in Recognition and Non-Recognition of Syphilis. E. M. Corner.
- 15 Importance of Very Thorough Examination in Cases of Foreign Body Alleged to Have Been Swallowed or Inhaled. E. D. Davis.
- 16 Case of Congenital Atresia of Bile-Ducts. S. Wyard.

13. Complement Fixation Reaction in Tuberculosis.—The technic employed by the authors in carrying out the tests resembles in principle that elaborated for the Wassermann reaction. As an indicator they used both sheep and ox corpuscles, and found the latter to be of advantage when the test serum contains an excess of the so-called "normal amboceptor" for sheep's corpuscles. Further, they allow one and one-half hours instead of one hour as in the Wassermann reaction for fixation to occur. The antigen was a simple emulsion of living tubercle bacilli. The strain

employed in the tests was of the human type isolated from a case of phthisis, and was grown on Dorset's egg medium.

Group 1. "Pathologically certain" cases: In this group are included only those cases of tuberculosis in which there was definite histologic or bacteriologic evidence of tubercle. An analysis of 85 cases gives the following results: Phthisis, 43 cases, 33 positive, 76.7 percentage, surgical tuberculosis (with the exception of tuberculous glands), 26 cases, 21 positive, 80.7 percentage, tuberculous glands, 16 cases, 6 positive, 37.5 percentage. Group 2. "Clinically certain" cases: In this series the diagnosis of tuberculosis rests on clinical examination only, as opposed to bacteriologic or histologic. In this series the results were as follows: Phthisis and pleurisy, 18 cases, 10 positive, 55.5 per cent., surgical, 42 cases, 30 positive, 71.4 per cent. Group 3. Tentative cases: The serums of 74 cases in which the diagnosis of tubercle was purely tentative were examined, and of these 18 were positive. The positive results included cases of pulmonary fibrosis, pleurisy, enlarged cervical glands, ulceration of bladder, synovitis, persistent pyrexia, etc. Group 4. Controls: The control cases, 87 in number, were taken without any selection and included a great variety of disease conditions in addition to normal individuals. All were negative with the exception of 3 cases, these being 2 cases of leprosy and 1 of Addison's disease. The serums of 18 syphilitic patients with positive Wassermann reactions were tested and all reacted negatively. In the face of these controls the reaction is regarded as being highly specific.

Annales de Médecine, Paris

June, I, No. 6, pp. 593-680

- 17 Epithelioma of the Thymus in a Case of Myasthenia. H. Claude, L. Giry and R. Parak.
- 18 Unusual Location of Murmur with Mitral Insufficiency. C. Pezzi and E. Bordet.
- 19 *Resistance of Blood-Corpuscles to Hemolysis by Saponin. E. May.
- 20 The Crisis in Pneumonia. L. Cotoni. Commenced in No. 5.
- 21 Signs of Interlobar Pleurisy. (Syndrome pseudopleurétique de la base dans les pleurésies interlobaires.) G. Laroche, Brodin and Huber.
- 22 Abscess in Side of Pharynx. A. Broca.
- 23 Urobilinuria as Sign of Liver Disease. M. Labbé and P. A. Carrié.

19. Test Hemolysis with Saponin.—May reports extensive study of the hemolysis induced by a 1 to 10,000 solution of saponin in a 9 to 1,000 solution of salt. The reaction depends on the cholesterol and lecithin content, and hence the corpuscles present a normal resistance to saponin in disease not affecting the lipoidemia, such as pernicious anemia and Bright's disease.

Archives des Maladies de l'App. Digestif, Paris

July, VIII, No. 7, pp. 361-420

- 24 *Functioning of Gastro-Enterostomy Opening with Permeable Pylorus. (Les bouches gastro-intestinales dans le cas de pylore perméable.) H. Hartmann.
- 25 *Fatal Acute Ulcerative Colitis. C. Flandin.
- 26 *Treatment of Hemorrhagic Rectocolitis with Tendency to Erosions. G. Friedel.

24. Gastro-Enterostomy Opening with Permeable Pylorus.—Hartmann reports a number of experiments on dogs and the roentgenoscopic findings in nineteen patients after gastro-enterostomy. In all the clinical cases the motor functioning of the stomach had not been impaired and no evidence of stenosis of the pylorus had been found at the operation. Recently reexamined after an interval ranging from one to eleven years, it was found that all the stomach content was evacuated through the pylorus in one case, and all through the artificial opening in eleven; in the others part passed through each opening. These clinical experiences confirm his experimental conclusion that the fact that the pylorus is and remains permeable does not inevitably render the artificial opening useless. A gastro-enterostomy in the antrum of a permeable pylorus amounts to the physiologic exclusion of the pylorus and the duodenum. But when the artificial opening is made nearer the cardia, in the reservoir part of the stomach, then this opening is useless for evacuation of stomach contents if the pylorus is permeable.

25. Acute Fulminating Colitis.—Flandin's patient was a previously healthy woman of 44 taken suddenly with acute dysenteriform colitis, fatal in less than four weeks, during which her sufferings were extreme. Some improvement followed exclusion of the large intestine, an artificial anus having been made in the small intestine, but the condition already was beyond repair and fatal perforation soon followed. The course is usually rapid and menacing in these cases of acute ulcerative colitis. Mummery has compiled eighty cases with 50 per cent. mortality.

26. Hemorrhagic Rectocolitis.—Friedel refers to cases in which there does not seem to be any ulceration and the blood gathers on the walls of the bowel like the sweat on the brow. There seem to be minute erosions, scattered or confluent, and the bleeding occurs at these points. He describes nine cases in detail. Hemorrhagic colitis of this type develops with intervals of apparent health; after fifteen or twenty days of diarrhea and hemorrhages all seems to return to normal. With cancer in this region there is usually less loss of blood at one time but the slight hemorrhage keeps up continuously. Treatment should act on the colitis and the rectitis, healing the erosions and supplementing or correcting insufficient gastric digestion or other dyspepsia by appropriate measures. Water and oil, he says, are seldom tolerated by the rectum but a mucilaginous vehicle is tolerated and acts as a kind of dressing for the inflamed mucosa. Surgical treatment is a comparatively serious matter and the outcome is not always satisfactory, while it entails danger of a permanent fistula. Medical measures, on the other hand, have always given him good results, while the technic is simple, easy and within the reach of all.

Journal de Chirurgie, Paris

July, XIII, No. 1, pp. 1-144

- 27 *Operative Treatment of Ankylosis of the Knee of Gonococcal Origin. (Traitement sanglant des ankyloses du genou d'origine gonococcique.) J. Okinczyc.
- 28 Fracture of Bones and Wounds of Joints during Balkan War. Laurent.

27. Ankylosis of the Knee of Gonococcal Origin.—Okinczyc deplores the too frequent custom of publishing cases before a decisive judgment on the outcome of operative treatment is possible, and the tendency to publish only the favorable cases. He recently encountered a man whose stiff knee had been resected a few months before with interposition of a flap of aponeurosis, but the knee is now stiff again. He has been able to find only eighteen cases on record of operative treatment of ankylosis of the knee of gonococcal origin, including Murphy's two cases, and the ultimate outcome is known in only five. Even in these the results of treatment were generally poor, so that there is little evidence to encourage operative interference unless the knee is severely crippled by the ankylosis or when both knees are affected, or, with incomplete ankylosis, there is pain when the leg is used. On the whole, it is much safer to respect a solid ankylosis and not to try to restore functioning to the knee. The gonococcal process is peculiarly prone to recur as the lesion usually extends into the tissues around the joint. Payr waited a year after the last symptoms before operating and then removed the capsule, ligaments, and fibrous tissue around the joint, leaving the musculature intact, and interposing pedunculated flaps of aponeurosis lined with cellular-fat tissue from the vicinity, and he has reported perfect functioning of the knee two years after the operation at two sittings, seven weeks apart. In his two other cases, with less extensive operations, the ankylosis has recurred in one. Okinczyc cites in conclusion two cases successfully treated by Morestin with arthrectomy to insure firm ankylosis after failure of various other measures.

Lyon Médical

July 26, XLVI, No. 30, pp. 141-180

- 29 Foreign Body in Left Bronchus; Harmless Extraction with Bronchoscopy; Three Cases. J. Garel, A. Gignoux and Arcelin.
 - 30 Delivery of Living Pygopagus. Lafourcade and Pfeiffer.
- August 2, No. 31, pp. 181-220
- 31 Gastro-Intestinal Disturbance from Kidney Calculi. L. Tixier.

Presse Médicale, Paris

August 1, XXII, No. 61, pp. 585-596

- 32 Paralysis of the Quadriceps Muscle. Ducroquet.
33 Apparatus to Correct Overriding of Stumps with Fracture of Long Bone. H. Hantcher.
34 Periodicity in Biology. (Les phénomènes périodiques.) Techoueyres.
35 *Auscultation Findings with Heart-Block. (Dissociation auriculo-ventriculaire complète.) G. Clarac and C. Pezzi.

35. Auscultation Findings with Heart-Block.—Clarac and Pezzi regard as most important the appearance now and then of a reinforced explosive first sound whenever it happens that the auricle and ventricle contract together; that is, when the systole of the auricle coincides with the first part of the contraction of the ventricle. This occasional explosive first sound always testifies to total heart-block if the ventricle beat is regular. Other significant auscultation findings are a systolic murmur at the mitral and tricuspid orifices, and also faint, dull, brief auricle sounds during the diastole, heard as the patient holds his breath.

Semaine Médicale, Paris

August 5, XXXIV, No. 31, pp. 361-372

- 36 *Serodiagnosis of Syphilis by the Coagulo-Reaction. L. Hirschfeld and R. Klinger.

36. Serodiagnosis of Syphilis by the Coagulo-Reaction.—Hirschfeld and Klinger call attention to an inhibition of coagulation which seems to be specific to syphilitic serum alone. Coagulation is the result of precipitation of the fibrinogen in the plasma by the thrombin. The thrombin itself is the product of the interaction of a serozyme (an albuminoid), a cytozyme (a lipid), and a calcium ion. The organ extracts used for the Wassermann test represent an active cytozyme and this property is not affected by normal serum; coagulation occurs with them whether normal serum is added to them or not. But addition of syphilitic serum arrests all coagulation. This is the principle of the new test, the inhibition of coagulation in oxalated beef blood-plasma when syphilitic serum has been added to the organ extract previously diluted with rabbit or other serum and a 1 per cent. solution of calcium in physiologic salt solution. The findings with this coagulation test in 750 cases paralleled those of the Wassermann test except that the coagulo-reaction seemed perhaps a little more sensitive.

Beiträge zur klinischen Chirurgie, Tübingen

June, XCII, pp. 1-866. Eppendorf Hospital Festschrift

- 37 Surgical Pavilion of Hamburg-Eppendorf Hospital. H. Kümmell.
38 *General Anesthesia for Patients Who Dread the Operation Extremely. (Narkotisieren ängstlicher Menschen.) Scholz.
39 Intravenous General Ether Anesthesia. H. Kümmell.
40 *Postoperative Tetany. Wiebrecht.
41 Therapeutic Puncture of the Corpus Callosum. (Ueber den A. v. Bramann'schen Balkenstich.) Ringel.
42 *Operative Treatment of Epilepsy. Weispenning.
43 Ankylosis of Jaw Causing Chin to Recede; Two Cases. (Kiefergelenksankylose mit "Vogelgesicht"-Bildung.) H. Hoffmann.
44 Pathologic Anatomy and Symptoms of Exophthalmic Goiter. (Morbus Basedowii.) P. Sudeck.
45 *Operation for Cancer of the Lower Esophagus. Hauch.
46 *Operation for Ruptured Aneurysm of the Aorta. H. Kümmell.
47 Gunshot Abdominal Wounds. (120 Bauchschussverletzungen aus dem Balkankrieg.) Wieting-Pascha.
48 *Infection of Gunshot Wounds. Kayser.
49 Diaphragmatic Eventration and Hernia. Hildebrand.
50 Pain in the Shoulder as Remote Phrenic-Nerve Symptom with Acute Surgical Abdominal Disease. Löffelmann.
51 *Operations on the Stomach. E. Roedelius.
52 Operative Treatment of Duodenal Ulcer; Sixty-Five Cases. II. Kümmell.
53 Acute Pancreatitis; Seventeen Cases. H. A. Dietrich.
54 *Disturbances after Cholecystectomy. (Warum bleiben nach Exstirpation der Gallenblase so häufig Beschwerden zurück?) Graff and A. Weinert.
55 *Gall-Stone Surgery. (Zur Gallensteinchirurgie.) J. Schulz.
56 Deformity of the Bile-Ducts. (Abnormitäten der Gallenwege.) J. Oehler.
57 Operations on the Spleen; Seventeen Cases. (Zur Chirurgie der Milz.) H. Hoffmann.
58 Appendicitis in Eastern Asia. E. Birt.
59 Connection between Pericolitis and Chronic Inflammation of the Cecum. (Blinddarmentzündung.) Vorderbrügge.
60 Cancer of Large Intestine, Rectum excepted; Thirty-Nine Cases. (Zur Chirurgie der malignen Dickdarmgeschwülste.) A. Welter.
61 Improved Murphy Button. (Der Stachel-Murphyknopf: Zeit-spärende Veränderung am Murphyknopf.) A. Flöckmann.
62 *Operative Treatment of Tuberculosis of Abdominal Cavity; Eighty-One Cases. (Bauchhöhlentuberkulose.) P. Kayser.

- 63 Importance of Surgical Training for the Gynecologist. F. Engelmann.
64 Ruptured Tubal Pregnancy; One Hundred Cases, All with Recovery. (Geplatzte Tubargravidität. A. Wepfer.
65 Alexander-Adams Operation; One Hundred and Eighty-Two Cases. H. S. Pfeiffer.
66 Traumatic Rupture of Pregnant Uterus. Thoenes.
67 Case of Tardy Rachitis. O. Bickel.
68 *Tabetic Arthritis. (Zur Klinik, Unfallbegutachtung und Behandlung tabischer Gelenkerkrankungen.) F. Oehlecker.
69 Bone-Plastic Operation for Enchondroma of the Hand. F. Oehlecker.
70 End-Results of Bloodless Treatment of Intracapsular Fracture of the Neck of the Femur. (Intrakapsuläre Schenkelhalsfrakturen.) Pohrt.
71 Curable Muscular Deformity of the Forearm in the Newly Born. (Eine Supinations-Extensionsbehinderung der Vorderarme resp. Hände bei Neugeborenen.) J. G. Chrysospathes.
72 Treatment of Talipes Calcaneus. (Hackenfuß.) W. Böcker.
73 Dislocation-Fracture of Head of Humerus. Janz.
74 Dislocation-Fracture of the Talus. Goldammer.
75 Impalement Injuries; Five Cases. Bengsch.
76 *Diagnosis and Treatment of Cancer. (Krebsstudien.) A. Stammler.
77 *Digestion Leukocytosis in Differentiation of Gastric Ulcer and Cancer. F. Bonhoff.
78 Operations for Arthrodesis on Shoulder, Hip-Joint and Knee. H. Gocht.
79 *Roentgenotherapy at the Eppendorf Hospital. H. Gocht, Kotzenberg and H. Derks.
80 *Radiotherapy and Anion Therapy. P. Steffens.
81 Technic for Radiotherapy of Cancer of Throat and Esophagus. Albanus.

38. General Anesthesia for the Badly Frightened.—Scholz refers to patients whose dread of the operation is worse for them than the operation itself. The mere entering the hospital and the preparations frighten them. Whatever the cause, their fright may be so intense that the anesthetic actually fails of its effect at first. They may conceal their dread but it is generally revealed by some sign on the part of the vasomotor and visceral innervation, which is peculiarly unstable in patients of this category. They are inclined to tachycardia, false angina pectoris, polyuria, glycosuria, nervous diarrhea, transient numbness, angioneurotic edema, shallow, rapid breathing with occasional deep breaths, tremor, pallor and dryness of the mouth. Carbon dioxid seems to be a special product of extreme dread.

Scholz has been making a special study of the influence of the above factors on the action of general anesthetics. The blood-pressure in such patients suffered a constant and regular decline as the ether or chloroform was administered, until consciousness was entirely lost. The average drop in sixteen cases was 44 mm. mercury in fifteen minutes. In one case the decline was 69 mm. In such a condition of low blood-pressure the patient is exposed to various dangerous reflex processes, especially to reflex syncope from irritation by the anesthetic of the terminals of the trigeminus in the nose, the reflex action from this involving the vagus terminals in the heart and the respiration center in the medulla. Rosenberg has found that this reflex can be warded off by cocainizing the nose. The fatalities as general anesthesia is just commenced are undoubtedly due to this dangerous reflex, although they are usually ascribed to an "idiosyncrasy to the chloroform or ether." The action of the reflex is exaggerated further by the abnormally small amount of carbon dioxid supplied to the respiration center owing to the shallow and fluctuating breathing, as Henderson has explained.

Another important reflex is shown in the extreme dilatation of the pupil from the first moment of the anesthesia, and its persisting thus instead of gradually contracting under the influence of chloroform. This should be regarded under all circumstances as a sign of a menacing idiosyncrasy to chloroform. He has encountered two such cases this year; in one, under 3 gm. of chloroform and 25 gm. of ether given with extreme caution, the appendix was removed without mishap from the badly frightened boy of 12; the other patient, a much-excited man of 32, had a profound collapse. Scholz regards this symptom as the only one which points from the very first to impending danger. Another set of reflex symptoms are like those noticed in a person who has fainted from fright. They can be brought on by forcibly holding the patient, pressing down the inhal-

ing mask, or other procedure that frightens him. These symptoms occur mostly in young, half-grown patients whose hearts are especially liable to fail under sudden fluctuations in blood-pressure.

Still another set of reflexes may be elicited from the abdomen if the operation is commenced before all reflex action is abolished. In a very nervous woman of 32 the blood-pressure dropped from 152 to 87 in fifteen minutes. The chloroform was then dropped and ether given and the blood-pressure went up. Eight minutes later, in profound anesthesia with blood-pressure of 110 mm., the peritoneum was incised and the appendix drawn out. The blood-pressure dropped as this was done to 75, a minute later to 66, and then to 62 mm. The anesthetic was then discontinued and the pressure rose to 77 mm. and the appendix was removed without mishap. If the heart had been less able to stand the strain in this case, there might have been a fatality. The trouble was probably a sudden relaxation of the tonus of the vessels of the viscera superposed on the injury already inflicted on the heart by the toxic action of the anesthetic. This last set of symptoms includes the reflexes elicited by abrupt changes of position. Scholz gives a number of roentgenograms of anesthetized dogs first reclining and then suspended with the head down, showing the remarkable displacement of the diaphragm possible in these conditions, and the resulting obstruction to the pumping action of the heart. In his two most serious clinical cases of collapse from change of position under general anesthesia the patient was in a dentist's chair.

He expatiates further on the remarkably long persistence of the reflexes in extremely frightened patients. Even after the corneal reflex is abolished, the pulse fluctuates with every tug at the viscera, and the anesthesia has to be made deeper. This encroaches on the margin of safety, and extreme care is necessary to give the anesthetic as regularly as possible and not to allow any wavering between the arousing of the reflexes and syncope. After the reflexes are abolished there may be collapse from overdosage, but this is always ushered in by a disturbance in the breathing—any change from the tranquil deep breathing is a signal for stopping the anesthetic. When tranquil deep breathing is restored, the anesthetic can be resumed. The whole secret is to tranquillize the patient, avoid anything suggesting force, and refrain from beginning to operate too early. Persons with an exceptional dread of the operation are exposed to peculiar dangers at the first whiffs of the anesthetic.

40. Tetany after Operations for Goiter.—Wiebrecht urges to refrain from injuring the parathyroids in operating on the thyroid. If tetany develops, he advises the implanting of fresh human parathyroid gland tissue or administering horse or beef parathyroids by the mouth. If neither of the above is practicable, parathyroid tablets might be given, along with calcium lactate. Curschmann advocates giving 20 drops of a 10 per cent. solution three times a day, gradually increasing the dose until the patient is taking several teaspoonfuls daily.

42. Operative Treatment of Epilepsy.—Weispfenning reviews the experiences in this line in Kümmell's service, a total of 31 cases of epilepsy without known trauma, 11 of traumatic epilepsy, and 2 of the Jacksonian type. Of 26 true epileptics, 11 per cent. were cured and 10 per cent. materially improved. Transient improvement was noted in 4 of the 13 listed as unmodified by the operation. In 11 of them the epilepsy was of long standing—in 7 over nine years. In the 11 traumatic epilepsy cases only one patient was cured and one improved. One of these patients developed general epileptic seizures for the first time after a large defect in the skull had been closed with a celluloid plate. The intervals were at first only four weeks but have been growing much longer and the seizures much milder.

45. Cancer of the Lower Esophagus.—Hauch gives an illustrated description of eighteen cases of cancer in the middle and lower esophagus in which he succeeded in removing the growth. One patient succumbed to a recurrence a year after successful resection of the cancer in the

lower esophagus and cardia. None of the other patients survived the operation or the following few days. The operative shock was evidently too great, possibly from the very efforts to shorten the operation.

46. Operation for Ruptured Aneurysm of the Aorta.—The man of 52 succumbed to heart weakness a few hours after Kummell had sutured the aorta after cutting and remodeling the artery so that it approximated the normal size. The circulation was shut off for twelve minutes by compression with the fingers and was then gradually released. The suture held perfectly and the patient was in good condition after the hour operation. It was done under intravenous ether anesthesia, keeping the heart action good with saline and ether. The previous loss of blood, however, had reduced the patient's strength so that he succumbed to gradual heart failure. The operation was done from the rear, resecting ribs (four to ten) and pushing the unopened pleura out of the way. This affords ample access to the intrathoracic esophagus and aorta. The aneurysm in this case was above the diaphragm.

48. Infection of Gunshot Wounds.—Kayser declares that modern experiences and science have reconciled theory and practice and shown that immobilization is the most powerful means at our command to ward off and fight sepsis. Fixation, he reiterates, is the key to success; fixation of the bacteria in the vicinity of the wound, and fixation of the dressings; fixation of broken limbs by supporting dressings, and fixation of the patient to his bed so that he will be transported on the one litter from the battle-field to his home. Bacteria are always with us, and the organism is generally able to cope with them if left unmolested and perfectly quiet.

51. Operations on the Stomach.—Roedelius reviews 312 operative cases in the last three years for gastric ulcer, cancer or other affection; resection was done in 43 cases and excision in 3, in 33 merely an exploratory laparotomy. The outcome was excellent as a rule in all but the 130 cases of cancer. Of 38 treated by resection, 39.5 per cent. have been clinically cured to date. The Roentgen rays were systematically applied in a large number of cases of malignant disease and although no benefit was apparent in many of the advanced cases, yet the unmistakable favorable effect in a few instances justifies further work in this line.

54. Why Patients Still Have Disturbances after Cholecystectomy.—Graff and Weinert sent question-blanks to 130 patients whose gall-bladder had been removed, inquiring as to their present condition. They had 124 blanks returned and 87 of the patients stated that the operation had cured them once and for all, and 4 others said that they had had no disturbances since the first month. That is to say, 73.4 per cent. had been permanently cured by the operation. About 78 patients mentioned that their previous tendency to constipation had been cured by the operation; stomach disturbances as a rule also subsided permanently afterward. In four cases attacks of pain and jaundice indicated that gall-stones had been left behind, but two had only a brief single attack and have been well since. In ten cases at least, adhesions are evidently responsible for the disturbances and the technic should be planned to ward-off production of adhesions. Subserous enucleation of the gall-bladder and roofing over the bed of the gall-bladder with peritoneum aid in preventing the development of adhesions, as also restricting tamponing to the minimum. If adhesions have already formed, the wounds left when they are broken up will give cause for still more adhesions to develop—another reason for operating early.

55. Gall-Stones.—Schulz regards the interference with the free circulation of bile during pregnancy as the chief cause for the development of gall-stones later. Not only mechanical, but chemical and other factors, aid in the process, including passive hyperemia, exaggerated destruction of red corpuscles and the toxic effect of fetal excrementitious matters. Among the 584 women in his 654 gall-stone operative cases in the last three years only twelve had not borne children among the 572 who were married. A tendency to

from 0.5 to 1.1 per 1,000 inhabitants since 1875. During this period the number of cases of malignant disease under the age of 20 has increased by 315 per cent.; between 20 and 50, by 246 per cent.; between 65 and 80, by 446.1 per cent.; and over 80, by 890.2 per cent. The proportion of cancer deaths to the total mortality has increased under the age of 20 from 0.43 to 2.05 per cent.; between 20 and 50, from about 24 to 77; between 50 and 65 from 82 to 216; between 65 and 80, from 38.12 to 147.40 and for over 80 from 11.02 to 54.55 per cent. The total increase in the proportion of cancer deaths to the mortality at large has been from 21.49 per cent. in 1875 to 81.37 per cent. in 1912. One fact stands out in his tables, namely, that the increase in cancer at all ages, except between 20 and 50, has been greater among men than among women. The increase in men between 20 and 50 has been from 2.09 to 3.4 per cent.; in women, from 3.13 to 4.26 per cent. for each 10,000 inhabitants.

101. **Recurrence of Gall-Stones after Operations.**—Lameris' case was apparently an instance of recurrence, as the woman's gall-bladder had been removed two years before and the bile duct carefully searched. The structure of the gall-stone found at the second operation, however, disproved the idea of recurrence, as the structure in the center unmistakably indicated that it was a calculus overlooked at the first operation, which had gradually enlarged by incrustation to its present size. The patient was a woman of 43 who had borne ten children.

102. **Inheritance of Color-Blindness.**—Waardenburg has noticed that the sex plays a part in the inheritance of color-blindness as it may be transmitted through normal daughters to grandsons. He urges physicians to investigate conditions in regard to heredity among the color-blind; whether the taint dies out, and whether when a woman is color-blind there was a familial tendency in both parents, also the different forms which the color-blindness may assume in different members of the family. He says that the first cases of color-blindness on record were in three brothers (Huddart, 1777), while the other children were normal. It is estimated that about 3 per cent. of all men are color-blind but only 0.25 per cent. in women.

103. **Starving Infants.**—De Lange refers to infants kept on rice water or barley water—possibly by a physician's orders—for some transient illness but which the mothers in their mistaken zeal continued long after the necessity for it had passed. The child is actually starving to death on this inadequate nourishment. De Lange has encountered twenty-four cases of the kind in the last two years, and she tabulates them in instructive fashion to show the present status; the exact causes; the measures applied, and the recovery under them; only four succumbed. De Lange remarks that she had never supposed there was any call in the Netherlands for an organization like the British Society for the Prevention of Cruelty to Children but since she has found two dozen infants thus starving to death, usually from blundering solicitude, she thinks there is certainly a call for reform. They resembled in appearance infants with relative acidosis from loss of water and salts—the condition which the Germans call "decomposition"—but the starved babies were not so apathetic and their livid tint was not so pronounced. Great caution is necessary at first in giving nourishment to an actually starving infant. Buttermilk renders good service here.

104. **Treatment of Paraphimosis.**—Van Cappellen injects into the edematous internal layer of the prepuce a weak solution of an anesthetic containing a little epinephrin. Under the influence of this the swelling subsides and the retraction of the foreskin can be readily overcome. He has applied this procedure in several cases and with constant satisfaction. The operation for the phimosis can then be done at leisure.

Semana Medica, Buenos Aires
May 7, XXI, No. 19, pp. 1005-1064

106 Filterable Viruses. R. Kraus.

107 *Toxic Neuroretinitis and Iridocyclitis under Salvarsan; Seven Cases. R. Argañaraz.

108 Vaccine Therapy of Typhoid. (Vacuna tífica Dessy.) F. L. Grapiolo.

109 *Gelatine Tampon after Operations on the Nose. (Hemostasia nasal post-operatoria.) A. Ferreyra.

110 Symptomatology of Circulatory Apparatus. A. Vito.

111 Position of the Bed in relation to the Magnetic Meridian, Rotation of Earth, etc. (Orientacion de nuestro lecho.) S. V. de Castro.

112 *To Render Finger Prints Visible. (Nuevos reactivos para la revelacion de huellas digitales invisibles.) Maestre and Lecha-Marzo.

107. **Toxic Neuroretinitis and Iridocyclitis.**—Argañaraz reported in 1912 six cases of severe optic neuritis following on the use of salvarsan; two were encountered in his own practice and the others were clients of other local physicians. He now reports a similar group of a severe toxic affection following the use of salvarsan or neosalvarsan, four in his own practice and three from the experience of other local physicians—the disturbances affecting the uveal tract and the sensory apparatus of the eye in these cases. The symptoms observed suggest a toxic action from the drug. In the cases in which the salvarsan was continued after they had developed—assuming that they were the work of spirochetes that had escaped the action of the salvarsan—the symptoms grew progressively worse as the drug was continued. One patient became blind and another suffered such intense pains that he pleaded to have his eye enucleated. The iridocyclochoroiditis became progressively worse with hemorrhages and secondary glaucoma, entailing the destruction of the eye. This fate also confronts another patient and no benefit has been derived from vigorous mercurial treatment. This young man had been given systematic mercurial treatment at the time he contracted syphilis, in 1912, and then was given two intravenous injections of salvarsan with an eight-day interval. Twelve days later his right eye developed iritis and he was given a systematic course of mercurial treatment, with iodid, but the serous iridocyclitis continued to progress, the iris became atrophied and adherent and vision from 1/4 had dropped to mere perception of outlines at about 7 inches. The further course in this case is not known.

In one of the group previously reported the syphilis was of fourteen years' standing, and had been kept under control with mercury. Then a single injection of salvarsan was given and bilateral optic neuritis developed at once, entailing almost total blindness. In conclusion Argañaraz cites from the literature various cases of amblyopia consequent on arsenical medication before salvarsan was discovered. The assumption that the eye affection in his cases would not have developed if the dosage had been adequate is disproved by two of the cases related in which the doses had been large and pushed after the first signs of trouble, the patient receiving six intravenous injections of neosalvarsan in four months, each of 0.9 gm. This is the patient, a man of 44, who begged to have the eye removed on account of the persisting pains; corneal sclerotomy was done twice and gave considerable relief.

109. **Gelatine Tampon after Operations on the Nose.**—Ferreyra injects about 10 gm. of a 10 per cent. gelatinized serum into the nose after an operation, having found that it spreads and rapidly hardens, forming an ideal tampon to arrest and prevent all hemorrhage. It leaves a passage open, while it is free from the danger of secondary hemorrhage later, such as is always to be feared when an ordinary tampon is removed.

112. **To Render Finger Prints Visible.**—More than twenty-one different methods for this purpose have been devised, but Maestre and Lecha-Marzo call attention to the superior value of zinc oxid to show up a finger print on a black background. For prints on paper, glass, etc., they recommend a mixture of iodine and eosin, heated until it vaporizes. The violet vapor then applied to the finger print brings out the lines very distinctly and permanently enough for the purpose. On paper, platinum black is even better. It has revealed finger prints not detectable by any other means in several criminal cases in their experience. Before anything is applied, the supposed finger print is photographed under oblique illumination.

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CHONDRECTOMY OR OPERATIVE TREATMENT OF BRONCHIAL ASTHMA*

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CHICAGO

The term "rigid dilatation" aptly defines a condition of the thorax wall often seen in old cases of emphysema and bronchial asthma. The bony, cartilaginous and muscular framework of this wall in young and normal subjects is united into an elastic lattice or basketwork, semirigid yet yielding, called very picturesquely by the Germans the basket of the chest (*Brustkorb*).

Functionally the thorax may be contrasted with the entirely rigid pelvis on the one hand and the non-rigid abdomen on the other, being intermediate in character—more flexible than the former and less flexible than the latter. Unlike the abdominal wall, which has powerful compression but only passive dilating power, the thorax wall has active expansion, creating negative pressure or suction and relatively little compressive force—chiefly passive.

In bronchial asthma and vesicular emphysema the chest becomes dilated or barrel-shaped and loses its power to contract when relaxed. The cartilages connecting the ribs to the sternum may take on a new hardness, due to partial ossification or calcification. They become asbestos-like and relatively firm and brittle in texture in some old patients, so that passive or elastic contraction of the chest is lost. The dilatation of the alveoli and lung tissue is so great that the chest wall remains fully expanded and the thorax loses nearly all power of lateral contraction. This produces or exaggerates the well-known symptom of expiratory dyspnea. Respiration must be carried on almost wholly by the diaphragm, which of itself has little control except over the inspiratory act. This is helped in part by the neck muscles which can fix and raise the clavicles and first rib, thereby lifting the whole thorax.

LOSS OF EXPANSION

In numerous cases examined in our clinic expansion was less than 1 cm., and in several it was nil, or too small to measure with the tape.

We owe what we know of the mechanical or surgical treatment of emphysema and apical tuberculosis to certain studies of a young Breslau physician over fifty years ago—1858. Freund, later a celebrated gynecologist at Strassburg developed this subject in eight papers from 1858 to 1910. These suggestions,

though published, lay almost unnoticed until after Listerism and the perfection of thoracic surgery, when he himself began to put his theories into practice and had the unusual satisfaction of seeing his technic adopted by Von den Velden, Garré, Hansemann and numerous other clinicians and freely credited as the Freund operation.

The term "Freund's operation" defines two distinct procedures, namely, the operation to relieve the barrel-shaped chest or rigid dilatation of old asthma and emphysema, and the operation to expand the upper outlet of the chest in certain types of apex tuberculosis. Both these operations, I am certain, have proved beneficial and even life-saving in my experience, but the latter—the one for emphysema—is of more practical importance so far in my work because more frequent.

MECHANICS AND PATHOLOGIC ANATOMY

Von den Velden, following Freund's classical work, shows the importance of defining clinically the various forms of rigid thorax, as the senile, or presenile, which is not in the form of dilatation or due to cartilage changes, the paralytic form and that due to kyphosis or rachitis, etc. The anatomic picture of rigid dilatation of asthma is peculiar and this form only is suitable for surgical treatment.

The essential feature is the calcification of the rib cartilages. They become bone-like and rigid, so that the chest wall cannot contract. Certain observers, as von Hansemann, take the rather extreme position that this bony condition rather than the asthma is the primary cause of the disease, the lung changes, such as thinning and atrophy of the alveolar walls, being secondary.

It is not necessary to believe this to admit the value of Freund's operation of chondrectomy. Surgical relief is possible in a certain type of these cases and ought promptly to be employed before dyspnea, cyanosis and too grave secondary changes have made all measures futile. I have found that these patients, usually old people with confirmed bronchial asthma and arteriosclerosis, nevertheless stand the interference remarkably well and are rapidly, almost instantly relieved, so as to be conscious of a betterment in their breathing and to show it in diminished cyanosis.

The method employed is a thoracoplasty which removes the costosternal joint and costal cartilages and substitutes a fibrous or hinge-like union of ribs to sternum, restoring at once full expansion to the thorax wall. Thoracic surgery has lost its terror, which was due largely to the dread that hangs about the unknown, and we no longer hesitate to open a pleural cavity without any cabinet or differential pressure. This operation need not endanger the pleura

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

or pericardium, although both are exposed, and does not, in my experience, cause any great amount of shock or present any serious technical difficulties.

REASONS FOR CHONDRECTOMY

It is the aim of the operator to detach from their sternal connections four of the ribs,—the second, third, fourth and fifth, and to make them permanently mobile by cutting out their cartilages. These four ribs are the only ones directly uniting the sternum, except the first, which will be referred to later. The diastasis of ribs from sternum is to be permanent. The intervening 3 or 4 cm. of non-rigid chest wall make a hinge joint to take the place of the excised hardened cartilages. Immediately after the operation there is more than a hinge action, a bellows or back-and-forth movement. The rib ends move longitudinally, alternately widening and narrowing the

The second, third, fourth and fifth costal cartilages are divided from the sternum and at or near the attachment to their rib ends. A little of the bony rib is best removed with each cartilage if the latter is short.

Unlike the Erstländer operation or ordinary rib-resection for carious rib or in empyema cases, in this operation the periosteum or perichondrium must be destroyed with the rib. This makes the dissection less easy, but not very tedious. In case of accidental puncture of the pleura no harm results. On its anterior surface, of course, this membrane comes easily with the rib; posteriorly, care must be taken by blunt dissection to make a line of cleavage between perichondrium and pleura, leaving the former intact on the cartilage. A spatula or Kocher director does this safely. Fragments of perichondrium seem prone to be left behind so that later more or less rigid cartilage reforms and makes the chest again inelastic. To prevent this I like to obliterate the groove left by each cartilage with a circular stitch of catgut. At least four other methods have been tested by followers of Freund in efforts to prevent this recurrence:

1. Hoffman sutures carefully the ends of the perichondrial tube over the stump of the cut-off rib, as is done in ordinary amputations through bone.

2. Axhausen applies the actual cautery to the remnants of these membranes in the grooves. This seems to me a grave danger to the adjacent pleura and lung and an obstacle to primary healing.

3. Bircher applies 95 per cent. phenol (carbolic acid) with the same intent. I have not tested this method.

4. Seidel uses slips or ribbons of adjacent muscles crossed like a letter X to fill the cavity between the rib end and the sternum. This I like very well, but find the lateral approximations of the groove just as effective.

A surprising feature of this work is the instantaneous relief obtained, not only after the operation but before its completion when the first cut through the cartilage is made. Instantly the chest wall expands and

contracts as it has not done for years and the gap in the rib opens and shuts with an excursion of 1 or 2 cm. As each section is made the expansion is increased, until when all four are divided they move apart and come together freely. In fact, the first relief is the best, and subsequent healing, as noted above, tends to impair the elasticity gained. In spite of the soreness of the incision the patient makes deep inspiratory and expiratory movements and his cyanosis disappears on the table. He can lie down as he has not done for years—resting his overstrained diaphragm and neck muscles which have been vainly trying to compensate for his reduced contraction.

WHEN CHONDRECTOMY IS CURATIVE

The proper selection of cases means success or failure of this as most other surgical operations. Not

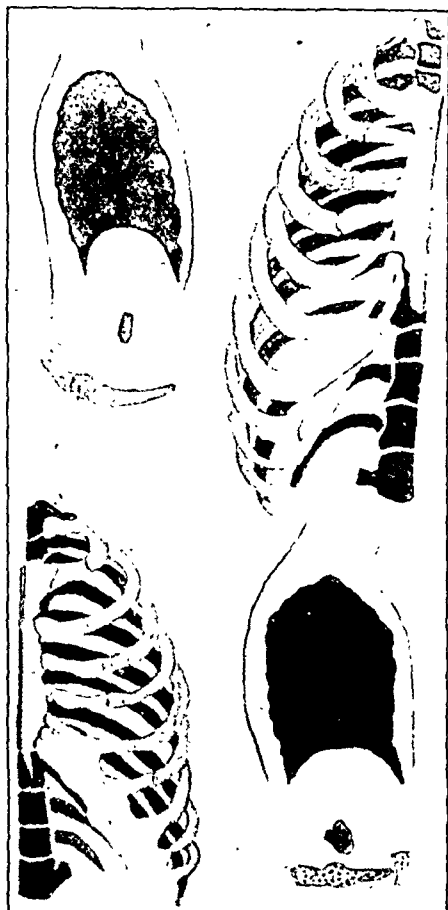


Fig. 1.—Normal chest wall and form of pleural cavity (above) contrasted with rigidly dilated wall and cavity (below) as sketched by Freund, Garré and others.



Fig. 2.—Barrel-shaped cast of chest and normal chest (above); roentgenogram of cartilages before and after resection (below) after Sauerbruch.

space between their cut ends and the sternum. This is lost later as the space narrows in healing. It is even difficult to maintain the hinge action because the cartilages tend to grow again unless all traces of perichondrium are extirpated. Special means of preventing this are a part of the plan of operation.

TECHNIC OF CHONDRECTOMY

The operation is relatively simple to any one familiar with rib-resection in general. The pericardium is not exposed to injury in operating on the right side. Unilateral chondrectomy is usually sufficient to give relief. Bilateral operations are always done in two stages. A longitudinal or parasternal incision is more conservative in my experience. The operation can also be done equally well through four short transverse cuts parallel to the four ribs removed.

all asthmatics—not even all cases of emphysema—are to be so treated.

Only cases of rigid and dilated chest are helped by it. The diagnosis rests not alone on cough and dyspnea, but we have certain objective conditions of the thorax wall. It becomes cylindrical. The ribs assume

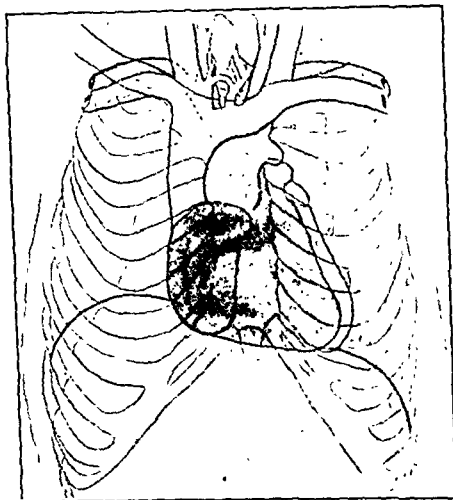


Fig. 3.—Relations (normal) of pericardium, pleura, rib and great vessels showing greater safety of chondrectomy on right side.

a more horizontal position than normal and do not sink in expiration. The sternum is pushed forward and the cartilages are bowed and rigid. This means that the lower thoracic outlet is enlarged. The epigastric angle is, therefore, widened from 100 to 140 degrees. Inspiration does not increase the chest cir-

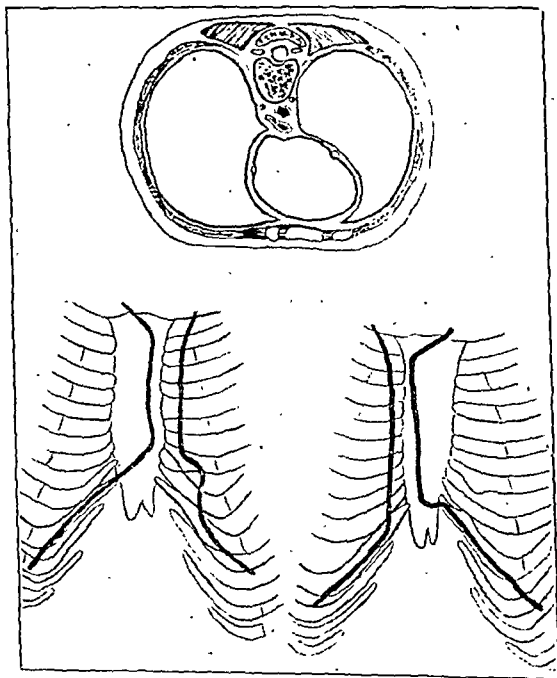


Fig. 4.—Reflections of pleura in inspiration and expiration, showing extreme excursion.

circumference. Expiration is slow and stridulous. There is cyanosis and capillary venous stasis. The diaphragm is flattened and the right heart area is widened. Vital capacity is reduced from 3,000 or 4,000 c.c. (normal) to 2,500 or less; in extreme cases as low as 800 or even 400 c.c. (Franzenheim's case).

INDICATIONS AND CONTRA-INDICATIONS

To sum up our knowledge of this new therapeutic measure, the indication for its adoption is the presence of the emphysematous chest rigidly held in the "inspiratory position," that is, dilated. The operation restores the lost power to take the "expiratory position," that of contraction.

As contra-indications may be mentioned severe cardiac and vascular disease, fetid bronchitis or bronchiectasis. Lambert warns against Freund's operation in cases due to costo-vertebral ankylosis, in which it can do only harm. Also Mohr warns us to exclude two other types of rigid thorax: (1) cases of tonic rigidity due to abnormal tension of the inspiratory muscles in nervous and cardiac asthma; (2) cases of rigidity following paralytic chest wall.

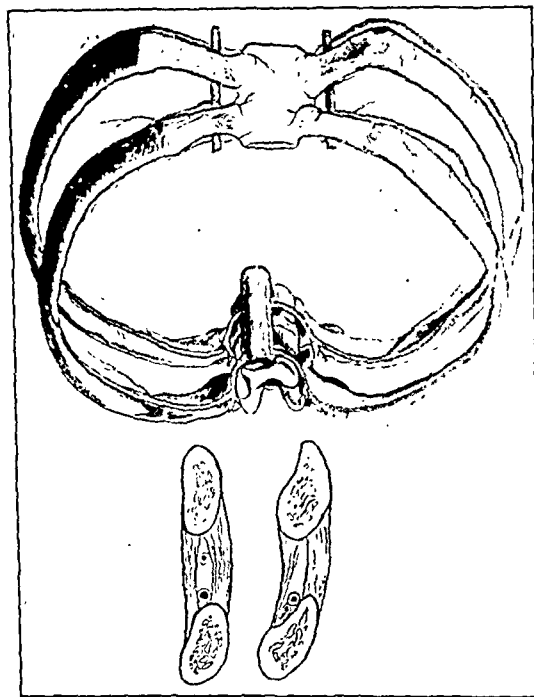


Fig. 5.—Relations of internal mammary and intercostal vessels. Sections of asbestos-like cartilages. After Garré.

WHAT MAY BE EXPECTED OF THE OPERATION

The true type for operation having been found—the barrel-shaped, rigid chest, with little or no expansion measured by the tape—much hope of relief is offered by chondrectomy. The operative mortality is almost nil. It is an operation very well suited to local anesthesia. With nerve-blocking of the intercostals it is absolutely painless. Relief begins when the first cartilage is cut through. It is an impressive sight to see the divided ends move freely in the wound where there had been no movement for years. Giving the stretched but still elastic lung tissue a chance to contract, we see that it proves its own elasticity after long overstrain. It is proper to remove the bony rib as well as the cartilage, if it seems to help the contraction. In one case I excised 6 cm. of the third and fourth ribs.

The diaphragm also acts more fully after the section, but in bad old cases we cannot always expect a perfect restoration of its cupola or dome, it having been flattened out by long stretching.

Vital capacity in good cases will be increased 50 or 100 per cent. Franzenheim reports one extraordinary

cross the front of the knee below the tubercle of the tibia. That bony prominence with the ligamentum patellae attached to it, is sawn off obliquely as in Sabanijew's amputation. The flap with the patella is then turned up. At the conclusion of the operation the tubercle of the patella is fastened to the tibia again. As with all these anterior horseshoe methods of arthrotomy, excellent exposure and access to the joint is obtained at the price paid for much division of soft parts at right angles to their line of action with consequent lengthening of the convalescence and increased postoperative disability. The position may be summed up by saying that transverse incisions in front of the joint are second-best, giving marked disability afterward from the necessary division of the soft parts.

Let us now consider longitudinal incisions, such as that of Professor Kocher, along the outer side of the patella. These are three in number: along the outer side of the patella, along the inner side of the patella and through a longitudinally split patella. Both of the lateral incisions are excellent, but, in my opinion, from their asymmetry they are not so efficient as the median incision and do not give so good a functional result as that into the joint through the longitudinally split patella. In it the rectus muscle, patella, and ligamentum patellae are split in the axis of the limb, no fiber being divided, thus having advantage over all other methods of opening the knee. It gives excellent access to all parts of the joint, even the posterior parts can be explored by sight, when the knee is flexed; and it does away with the need of that "septiciferous" process, putting a finger into the joint. To use fingers at the operating-table is usually as bad manners as to use them at the dinner-table—a very

The conclusion of the operation is simple and quick. The synovial membrane above the patella is closed by a fine continuous catgut suture. This is important as it prevents blood from the loose areolar tissue above the subcrureus pouch from entering the joint. The split in the rectus muscle and ligamentum patellae is closed by another continuous catgut suture, which also holds the two halves of the longitudinally split patella together and holds it so efficiently that a roentgenogram taken a day or two after the operation shows "no injury to the patella obvious." Sides of the wound are approximated by three or four rectangular (mattress) sutures of catgut, and the edges coapted by a continuous suture of fine catgut with the stitches close to the skin and to one another. These stitches need never be removed. No splint is necessary but its use for twenty-four hours is beneficial. After that a nervous patient can have the limb bandaged in wood-wool. The wood-wool can be removed from time to time and the patient allowed to move the leg. I never hurry convalescence, the patient remaining in bed about three weeks. Massage and electrical stimulation of the muscles can be begun a few days after operation. Passive movements are hardly ever necessary. Active movements by the patient are much better, and even a nervous patient may be encouraged to make them.

A study of the physical geography of the knee will give some clues to the parts played by the various component structures in the physiology and pathology of the joint. At the knee a convex bone (the femur) is held to a flat bone (the tibia) by a capsule of fibrous tissue, thickened at the lines of stress at the sides into ligaments, the external and internal lateral ligaments. But if this was all, the length of the capsular ligaments would allow the tibia to move in all directions on the femur, as well as backward and forward. Such a joint would be horribly unstable and unsafe. To remedy this there are placed inside the knee-joint two sets of structures, the crucial ligaments and the semilunar cartilages. These are united in part at their tibial attachments, both in front and behind. Together they give strength and firmness to the joint, limiting the gliding of the femur on the tibia. In the normal movements of a joint they will sustain no harm, but should the movements become exaggerated, as in a wrench or sprain, they will be damaged. Naturally also the structure which bears most strain in ordinary life will be most liable to sustain damage in extraordinary movements. It will also be the strongest and therefore the best able to withstand a shock. The crucial ligaments are the strongest ligaments in the knee-joint and bear by far the greater part of the strain. In an accident, as in ordinary life, the severest strain will fall on them. Hence it is to be anticipated that injuries to them will be both frequent and important. We know little

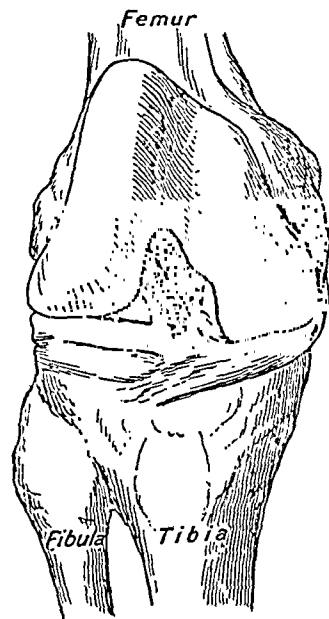


Fig. 5.—The crucial ligaments in a flexed knee, anterior view.

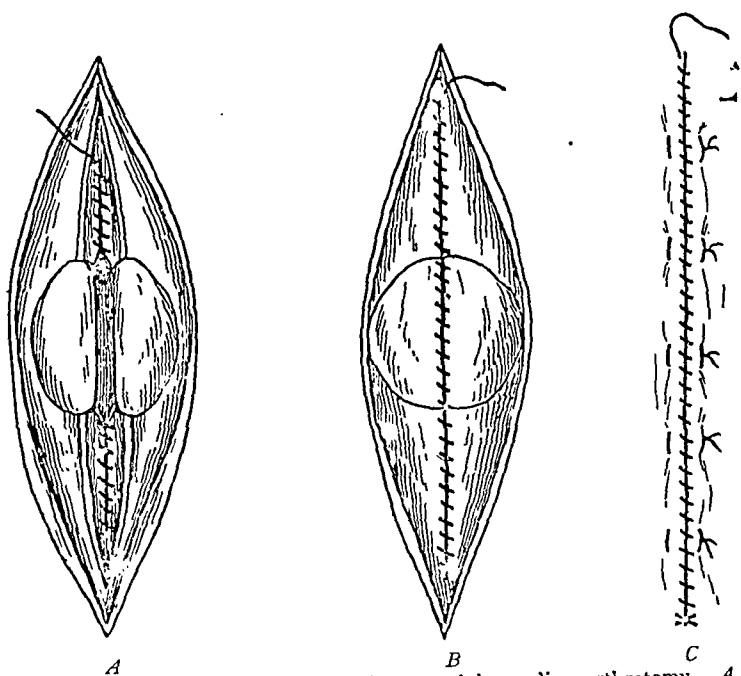


Fig. 4.—A method of closure of the wound in median arthrotomy. A, the synovial membrane closed by two (one suprapatellar and one infrapatellar) continuous catgut suture. B, closure of the rectus, patella and ligamentum patellae with a continuous catgut suture. C, skin wound closed with a continuous catgut suture and some tension stitches.

important point, for unless certain of his aseptic technique no surgeon has the right to recommend a patient to allow him to open his knee-joint. This operation was advocated recently in the first number of the *British Journal of Surgery* by Mr. Robert Jones of Liverpool for access to some results of injuries to the spine of the tibia. He has now extended its application with satisfaction and success.

such injuries, probably because they would not be fatal, and the deep situation of the ligaments renders their inspection difficult. There are clinical signs, however, which would indicate their lesion.

1. Movement of the tibia on the femur.
2. Any dropping back of the tibia of the femur.
3. Any rotation of the tibia on the femur, almost always external.

In all these three signs the leg must be carefully compared with that of the other side, which should not previously have sustained an injury. In an old knee injury none of the above-mentioned signs need be found so that a most valuable symptom is the patient complaining of lack of stability in the joint, the knee giving way, the patient feeling afraid to trust to it. Such knees are well known clinically as "slipping knees," and are, I believe, produced by the sliding of the femur on the tibia. If a group of patients in whom the result of the operation for the removal of the semilunar cartilage is unsatisfactory are examined, a very large number will be found to have slipping knees. Normally a little rotation of the tibia on the femur is permitted. But this should be the same on both sides and can be easily seen if the patient sits

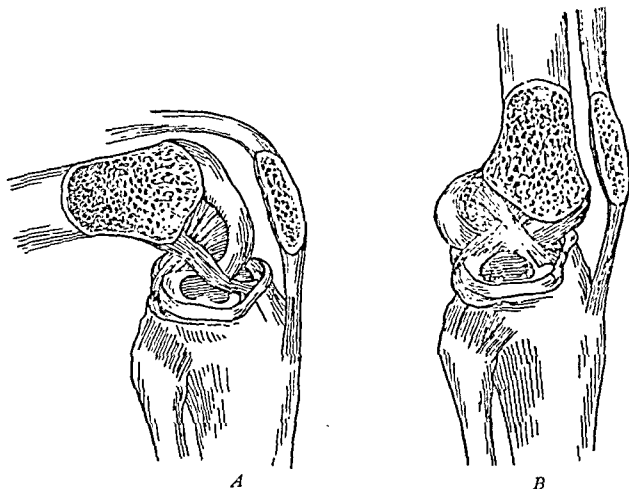


Fig. 6.—The crucial ligaments in a sagittal section of the knee; A, flexed, B, extended. This is taken from a standard text-book of anatomy and is designed to show the anterior crucial ligament tight in extension (B) and the posterior crucial ligament tight in flexion (A). This is wrong; both are taut in full flexion and full extension and both are slack in semiflexion.

down with legs extended and heels on the ground. Look to the position of the feet. This rotation is not limited by the crucial ligaments only, but also by the semilunar cartilages. Two general remarks may be made.

1. The *crucial ligaments* bear considerable strain in all movements of the knee and seem most prone to injury in exaggerations of flexion and extension of the knee, that is, by movements in a vertical plane, the patient standing. With lateral movements an injury of the lateral ligament, almost invariably the internal lateral, must sustain damage, partial rupture, before the crucials are dangerously stretched.¹ Rotation movements of flexed knees are more likely to produce injuries to the semilunar cartilage, which injuries are made permanent or increased by subsequent movements of extension. For instance, by it the displaced cartilage may be fractured.

¹ Corner, Edred M.: The Role of the Crucial Ligaments in the Knee-joint and Injuries to the Knee, *Lancet*, London, May 9, 1914, p. 4,007.

2. The *semilunar cartilages* bear most strain and are most likely to be injured with movements of rotation with semiflexed joints.

Other ligaments of the knee are not likely to be injured with the exception of the internal lateral ligament, whose injury I believe to be a preface to, when partial, that of the crucial ligaments; and when complete, a sequel to the complete rupture of the crucial ligaments.

Before we leave this subject it will be well to recall to mind that when the crucial ligaments bear a strain their bony attachments bear that strain also. Partial rupture of these ligaments is often overlooked. I must confess that I have encountered one instance which I believe to be due to the bony union of an overlooked and partially detached spine of the tibia. So far as our knowledge goes at present, the anterior attachment of the anterior crucial ligament is most often detached alone. The other three attachments of these ligaments often seem to escape. Such ideas must be received with great caution, however, as the tibial attachment of the anterior crucial ligament is the one which is more easily seen than the others and naturally we come to knowledge of it first. It is said

that with rupture of the anterior crucial ligament there is pain and disability on extension of the limb; while with a lesion of the posterior crucial ligament there is pain and disability on flexion of the knee. I do not think that it is possible, clinically, to dissociate tension on these two structures. With injury to these liga-

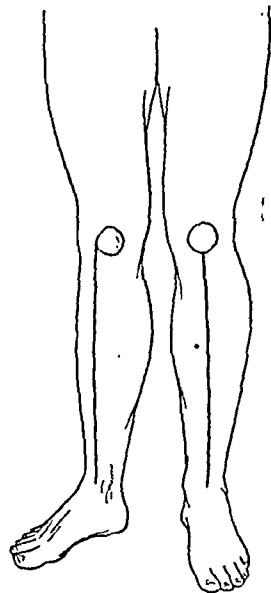


Fig. 7. — Semidiagrammatic sketch to illustrate the skin-line with and without partial rupture or stretching of the crucial ligaments produced by the external rotation of the tibia of the femur, right leg.

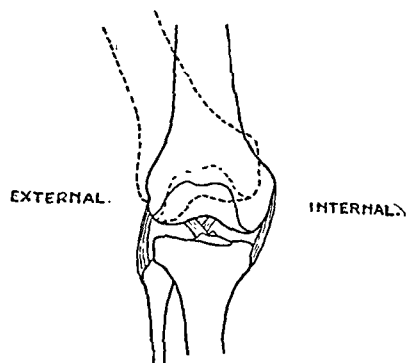


Fig. 8.—Showing the strain placed on the crucial ligaments in movements of the knee-joint.

ments there is pain both on full flexion as well as on full extension of the joint. In fact, there is pain on all extremes of movements of the knee, flexion extension or rotation, because the crucial ligaments are tightened by all these movements; hence their liability to injury.

The strain on the crucial ligaments is not all. The synovial membrane is loosely attached round the front of the knee, where it must move with movements of

the joint, but is closely attached to it as it covers the crucial ligaments and the back of the joint where there is no need for it to move. Stresses and strains in that situation easily tear it even if there is nothing but a slight and temporary stretching of the crucial ligaments. The roentgenograms of the artificial (wire) anterior crucial ligament show that the loops separate with flexion and extension of the joint,⁴ thus giving



Fig. 9.—The roentgenogram of both knees is shown so that the external tubercles of the tibia may be compared as they exist in each knee. That on the left side is much sharper and more slender; possibly it was broken and partly detached by the accident, uniting with extension of ossification into the anterior crucial ligament.

some idea of the amount of stretching which the crucial ligaments are constantly undergoing. Bleeding thus caused will lead to the joint becoming filled with blood and, later, synovia, a condition of hemarthrus. Formerly it was never quite understood why blows on the knee should give rise to synovitis, the joint becoming full of bloody fluid. Now it is intelligible. The force of the blow is transmitted, say, from the patella to the femur, which it attempts to drive backward, but is prevented from doing so, in part, by the crucial ligaments. These ligaments, particularly the anterior one, are stretched, and the tightly bound-down synovial membrane over them is torn. Hence hemarthrus and traumatic synovitis. The blood comes from some small intra-articular lesion caused by some slight displacement of the femur on the tibia, or *vice versa*; and the effused blood acts as an irritant to the synovial membrane, inducing inflammation and hypersecretion. From this we may learn that the sooner the effusion of blood ceases and the effused blood is removed from the joint, the better for the patient. Mere tapping cannot do this. The joint should be opened and washed clear. The tear in the synovial membrane, or otherwise, can be sutured or not according to the case. I would commend to your notice the possibility of taking this unusual step in what seem to be "bad" cases, and for this reason. The synovial tear, or tears, will heal by a layer of fibrin being deposited on it, like healing under a blood clot or scab. If this fibrin becomes displaced by a movement of the joint

another layer of fibrin will form. The displaced fibrin may be removed by the leukocytes, or it may be shed into the joint. If it does the latter, it may form the nucleus of a loose body in the joint. I would suggest that in many cases the signs of the inflammatory origin of a "joint-mouse" are secondary to the repair of some trauma.

On looking through the records of sixty-one cases in which loose bodies were removed from the knee-joint and recorded in the St. Thomas' Hospital Surgical Reports, one cannot avoid being struck by six things:

1. How uncommonly the origin of these loose bodies is ascertained.
2. How often they are multiple.
3. How often they are called recurrent.
4. How often they consist of fibrin.
5. How often they are temporarily lost in the joint.
6. Apparently how long they can be present without causing any urgent symptoms.

The detached fibrinous plaque grows like a crystal in a saturated solution of its own salt. It becomes triturated and rolled by the movements of the joint and it would appear that at times it undergoes bony or cartilaginous changes. I have found bodies, previously felt loose in a joint, attached to the synovial membrane. For a loose body to become so attached is a distinct reversal of the generally accepted idea that nodules in the synovial membrane may become detached and form loose bodies.

I would suggest that the majority of loose bodies in the knee-joint have an origin in a tear in the synovial membrane of the posterior part of the knee-joint, particularly in the thin and tightly bound-down synovial membrane over the crucial ligaments. Such an idea suggests that a free exploration of the knee-joint be done more often in cases of hemarthrus. This is

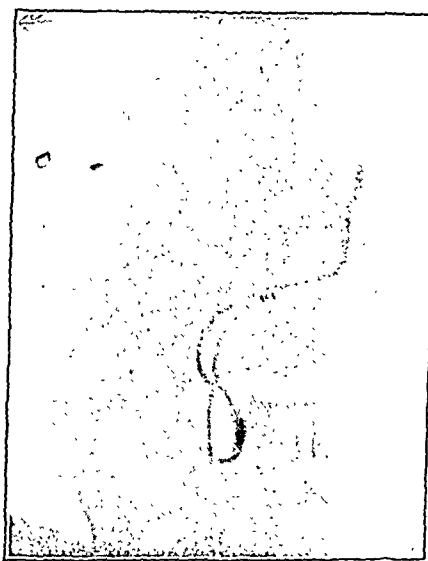


Fig. 10.—Anterior-posterior roentgenogram of a knee in a case of ruptured anterior crucial ligament in which a new anterior crucial ligament was made with two loops of silver wire. The patient was shown to the Clinical Section of the Royal Society of Medicine, London.



Fig. 11.—Lateral view of the knee shown in Figure 10.

alone justifiable with modern technic. The knee-joint is not more prone to grow foreign bodies than other living tissues. Yet such bodies are rare in other joints! Can it be so because they have no such arrangements as there are about the crucial ligaments of the knee?

4. Corner, Edred M., and de Mowbray, R. M.: Fractured Spine of the Tibia, *Proc. Roy. Soc. Med., Clin. Sec.*, April, 1914, p. 122.

To the question when to open a joint after an injury the answer is either at once or as soon as the hemorrhage has ceased. To do all this satisfactorily I would urge the use of the method of opening the joint by splitting the patella longitudinally. The method reveals a further series of problems, commencing with the question of tapping the joint.

When the patella is split longitudinally, it is seen that the knee-joint consists of three cavities, two simple and one complex. The first cavity, the suprapatellar, lies on the femur, above the patella, whose contact with the femur very largely divides it off from the middle chamber of the joint. The middle chamber is formed by the patella above and by the ligamentum mucosum with its alar ligaments below forming a diaphragm across the joint by extending from the front of the joint to the condyles of the femur behind. The third or posterior chamber lies behind this diaphragm, between it and the posterior ligament of the knee-joint. It is complex, as the crucial ligaments project into it from the posterior wall, like a partition which does not reach the anterior wall and imperfectly divides the chamber into two lateral halves, communicating in front.

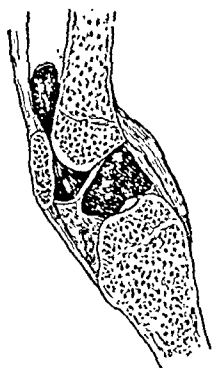


Fig. 12.—Sagittal section of knee, showing the three main chambers in it: suprapatellar, middle, and posterior.

When the knee is distended all three chambers communicate with each other. The patella is raised from the femur by the fluid distending the joint, throwing the upper and middle chambers of the joint into wide communication. The progress of the communication is directly proportional to the tension in the joint; but as the joint is tapped and the distention lessened these cavities cease to communicate so freely. It is quite impossible to empty the knee-joint by tapping. The suprapatellar and the middle chamber can be emptied but not the posterior. It is in the nooks and crannies of the complex third and posterior chamber that the organisms of infection will find most peace and quiet to enable them to multiply and grow strong. This is the most important chamber to empty and at the same time the most impossible. Who wonders that treatment by the tapping of the knee-joint is ineffective? It is like removing the smoke but allowing the fire to burn. Almost its only use is to supply a specimen of fluid for examination.⁵

Let us apply this knowledge to the lavage of a septic joint. For success it is desirable, if not absolutely necessary, to wash out thoroughly the posterior chamber of the joint. This cannot be done while the ligamentum mucosum and the alar ligaments are intact, so they must be cut away or the femoral attachment of the ligamentum mucosum separated, then carefully all the nooks and crannies of the complex posterior chamber of the joint washed out, this being done, if at all possible, without cutting away the ligamenta alaria, because of the oozing of blood which may take place afterward. For similar reasons the synovial membrane above the patella should be closed with continuous catgut suture. It prevents blood from the loose tissue between the crureus muscle and the

suprapatellar pouch of synovial membrane entering the joint cavity. The surgeon should avoid, if possible, splitting the synovial membrane over the pads of fat below the patella. If he does split them, the edges must be sutured. I suture the rectus muscle above the patella with another suture, which is continued over the patella to join the halves of that bone and of the ligamentum patellae (Fig. 4). The bone requires nothing more. Wiring is not needed. Yet in the great majority of cases a roentgenogram taken shortly after operation shows no obvious injury to the patella. The skin is closed by a method devised to insure the complete and rapid closure of the wound. The sides of the wound are approximated with two, three, or four mattress sutures of catgut. These edges are then coapted by a continuous suture of catgut, the stitches being inserted close to the skin edge and to each other, securing the almost immediate sealing of the wound. Movements may be commenced at once; and after twenty-four (or twelve) hours all dressings can be discarded.

I have experimented with many catguts. Those whose sterility is acquired with chemicals, for instance, chromic acid, mercuric chlorid, etc., are unsuitable. As the catgut is absorbed minute doses of these chemical irritants are set free in the wound, yielding in many cases a moist, almost eczematous, condition of the superficial wound. Iodin catgut is better, but the gut can be so hardened by iodine as to be almost unabsorbable. The wounds, however, are drier. In fact, plain iodized catgut sterilized by heating in some non-irritant fluid, for instance, xylene (xylol), seems to be best suited for this purpose. The stitches need never be removed. Suture without drainage is best; but the

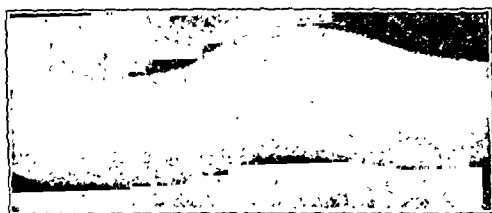


Fig. 13.—Leg fourteen days after operation, extended.



Fig. 14.—Leg fourteen days after operation, flexed.

wound, not the joint, can be drained in the upper part of the wound by a tube inserted into the areolar tissue between the quadriceps muscle and the joint. If drainage should become necessary later it can be done in the popliteal space and always a few days after operation.

In all cases with pyrexia the popliteal space should be examined at every dressing and compared, for fulness, with the popliteal space of the other leg. Pus escapes easily from the posterior chamber of the knee-

5. Corner, Edred M.: *Clinical Lecture on the Treatment of Joint Disease*. Med. Press and Circular, May 13, 1914, p. 484.

joint along the azygos vein into the popliteal space. In the popliteal space it is shut in by the dense, tough popliteal fascia which forms a roof over it, causing it to travel by the way of least resistance up the thigh under the hamstring muscles and down the leg under the gastrocnemius. The overlooking of the escape of pus or any infective material from the knee-joint into the popliteal space is very easy and its results, owing to its deep extensions, are very disastrous, often leading to the loss of the limb or to pyemia. I would strongly urge that it is better to make even an unnecessary incision in the popliteal space than run the risk of overlooking this escape.

TREATMENT

1. *Stretched or loose crucial ligaments.* This is almost invariably the anterior. With a drill a hole is driven through the external condyle and through the loose ligament. On it an unabsorbable suture is threaded and one end drawn through the condyle. The other end is passed once around the ligament and the end withdrawn, *secundum artem*, through another hole made through the external condyle, not far from the first. By tightening this suture the corresponding crucial ligament is tightened or reefed. A similar maneuver would tighten a loose posterior crucial ligament, but I have never found it necessary to do so. That ligament seems almost invariably to escape and it would seem that the anterior crucial ligament is stretched and ruptured before the posterior can be hurt.

I do not believe that there can ever be a stretching or rupture of the posterior ligament unless the anterior yields first.

By tying the suture the ligament is reefed and made tighter. The suture is tied with the knee a little flexed, as when the ligament is tightened in this position, the joint will be extended subsequently but little beyond it. Patients all admit that this strengthens their knee. The holes are drilled through the external condyle to tighten, or reef, the anterior crucial ligament; because that ligament is attached to that condyle. The posterior crucial ligament would be "reefed" through the internal condyle.

2. *The semilunar cartilages.* When a knee-joint is injured many structures within it may be affected, and from time to time it becomes necessary or advisable to remove a semilunar cartilage. The figures for St. Thomas' Hospital, London, show that it is sixteen times more frequent to operate on the internal cartilage than on the external. The operation of removal of the cartilage can best be done through a comparatively small incision on the corresponding side of the joint. Clinically one is sure that if the cartilage suffered sufficient damage to fracture or dislocate it, other structures in the joint will also have been injured. If the injuries to these structures cannot be put right, the result of the operation on the cartilage will be unsatisfactory. I would urge that, in certain cases, the asymmetrical local incision for removal of the cartilage be not made, but a median one, such as that of splitting the patella longitudinally, be made so that everything in the joint can be examined. Particularly is this so where the clinical diagnosis is vague, such as "internal derangement of the knee." By this method there is very excellent demonstration of the joint and I have found wonderful and undiagnosed fractures and dislocations of the cartilage, intra-articular fractures of the femur, "foreign" bodies, injuries

to the crucial ligaments, fractures of the spine of the tibia, and so on. If the work is done thoroughly there is less danger of doing it without satisfaction to the surgeon or patient.

3. *Internal derangement of the knee.* When the knee is injured the resultant traumatism falls on many structures, not on one. It is more or less comparable to internal derangement of the abdominal viscera, enteroptosis. It is therefore necessary to open the joint thoroughly and see what is the matter and take steps to correct it. The faults in a knee-joint may be many: injury or dislocation of the semilunar cartilages, injuries to the crucial or other ligaments, intra-articular fractures of the femur, fractures of the tubercles of the spine of the tibia, and, if the case has gone on long, hypertrophied fringes of the synovial membrane, or loose bodies may be present. One must not be satisfied with finding one fault, many may need to be corrected. From the point of view of prognosis, diagnosis and treatment, the median and general incision is to be recommended, as it allows of a wider and more exact line of conduct.

There is one point especially to which I would like to refer. Certain patients feel that the knee is not strong, is not to be trusted, gives way unaccountably. In these patients at operation it is found that the anterior crucial ligament is "slack," having been injured, stretched, or partially torn, and that an elevator is easily thrust between the internal condyle of the femur and the tibia. The condyle, by slipping on the tibia, gives the patient the feeling of insecurity and untrustworthiness in the knee and accounts for the knee giving way and the patient falling. Let that crucial ligament be rendered taut, or reefed, and the knee will be much strengthened. In fact, the surgeon may feel sure that at the operation the ligament will be "overreefed" and the patient slow in recovering full movements of the joint because of the overtight ligament. This merely necessitates a longer convalescence but with as good result. I would say that it is better to overreef than underreef the ligament. By overreefing the surgeon has something in hand which he can afford to let go—his patient is above the line of security; an underreefer has not, and his patient is below the line of security.

Of recent years, since it has been proved that the operation can be done safely, it has unfortunately become the custom to remove internal cartilages from the knee-joint with comparatively little thought. Indeed, one feels that at times the cartilage is removed with even less consideration than the appendix. The patient is almost always better temporarily, owing to the postoperative stiffness and apparent strength of the knee. The existence of such a state of affairs is perfectly natural in the evolution of surgery; but it is no great credit and the sooner it is modified by some method enabling the surgeon to take a wider and more general view of injuries to the knee, the better. To how many doctors is injury to the knee synonymous with injury to the semilunar cartilage?

4. *Intra-articular fractures of femur.* They consist of fragments broken off, usually from the internal condyle. This part of the femur is much more liable to injury than the external condyle. Hitherto the practice has been to remove the fragment, and I have followed it, but I believe that the proper treatment is to replace the fragment and maintain it in position by a rectangular catgut stitch passed through the condyle of the femur. I cannot think that depriving the

articular surface of the condyle of a square inch or more of cartilage can be beneficial to the joint. Indeed, I believe it to be a common cause of chronic synovitis after injury to the joint.

It is noteworthy that both the internal condyle and the internal semilunar cartilage are much more often injured than are the corresponding parts of the other side. The explanation is found in the more extensive movement of the internal condyle of the femur on the tibia, the greater amplitude of movement offering more chances of injury. Rupture, complete or partial, of the crucial ligaments, particularly the anterior, would result from the superlative exaggeration of such rotation of the knee. It can be easily understood that such an extensive and violent rotation is hardly possible. So any injury to the posterior crucial ligament is very rare.

5. *Fractures of the spine of the tibia.* The subject of fractures of the spine of the tibia and rupture of the crucial ligaments of the knee has been reviewed and made the subject of a masterly paper, such as we should expect, by Robert Jones of Liverpool and Alwynne Smith of Winnipeg, in the first number of the *British Journal of Surgery*, July, 1913. In it they record seventeen cases which they have seen in the last three years—a truly large number, which tells that we humbler mortals fail to recognize the true nature of the cases we see. They urge that these cases should be treated conservatively. Perhaps this is the mature wisdom of more years than those of which I can boast; but I never like to leave blood in a joint, and a loop of catgut to form a rectangular intra-osseous suture in the tibia to anchor the detached spine would seem to me to be more in keeping with the surgical practice of to-day than the removal of the detached bone: the convalescence would be shorter, and the functional results should be better.

Some authors speak of detachment of the ligamentum mucosum from the femur as an item in the internal derangement of the knee. I have had no clinical experience of it except as an incident in much more serious injuries. I would regard its presence as an indication that the joint had been severely injured and that other injuries were to be looked for, if not actually present.

ABSTRACT OF DISCUSSION

DR. JOHN B. MURPHY, Chicago: Mr. Corner's paper is certainly a distinct, positive statement of the line of procedure that should soon become a habit. We have been too fearful of opening joints. We have been too willing to accept the external physical evidence and later the Roentgen ray evidence as to the lesions in the joint. If I were to give a percentage I would say that between 40 and 50 per cent. of the later cases of knee-joint lesions which incapacitate the patients have no Roentgen ray or other signs sufficiently positive to justify a procedure from that evidence alone. That is why the line laid down by Mr. Corner is one that is going to be followed. The lateral is not nearly so good as the median incision. It took us a quarter of a century to learn the technic of conservative exploration of the peritoneum, not to touch the surfaces, except when there is an absolute necessity for it. One should not keep sponging and rubbing and handling the synovial membrane of a joint more than one would a peritoneal surface under the same circumstances. If it is done as much as with the peritoneal surface great effusion will follow the operation. Do all of the work with instruments without sponging, handling or manipulating the synovial membrane. That is the key to the work. The median division of the patella and its ligaments above and

below is no more serious than the division of the bone in any other position after one learns. I was particularly interested in the fractures of the spine of the tibia. Visitors to my clinic will recall that I had two patients of this type in which I had exostosis after the fracture so that it incapacitated the patient and had to be removed by the chisel through the joint. We are only beginning to appreciate the significance of recurring traumas in joints, as pinching of the capsule, fracture of the semilunar cartilages, intra-articular villous formations, etc. Recurrent mild internal traumas in joints are extremely injurious to the synovial membrane and induce hypertrophy, fibrosis, synovitis, etc.

DR. HENRY O. MARCY, Boston: Mr. Lister taught me when I was his first American pupil that it was not so serious a thing to open the knee-joint as had been earlier supposed. To open the knee-joint in the early days of surgery was considered entirely beyond the realm of correct operation. When in 1880 I reported 150 operations on the knee-joint I hesitated to read the paper. I expected only criticism and no approval. Dr. Rowe said "To-day we have learned a new chapter in operations on the knee-joint." Dr. Sayre said to me "You have made a devil of a row in my line of surgery to-day," and that was an expression of the possibilities of opening the knee-joint at that time. The operations on the crucial ligament are something quite new to me.

DR. FREDERICK J. FASSETT, Seattle, Wash.: In opening a knee-joint through sagittal section I have been impressed with the close attachment of the crucial ligament to the cartilages. Would the crucial ligament play a part in the loosening of the semilunar cartilage? Given a diagnosis of a loose semilunar cartilage, would this be the incision of choice?

MR. E. M. CORNER, London, England: Do the crucial ligaments play a part in the loosening of the internal semilunar cartilage? The answer is yes, they do play a very great part. If the crucial ligaments in bearing the strain give way, no further injury is likely to occur. If the crucial ligaments stand firm then the semilunar cartilages, particularly the internal, will probably yield. You will meet in practice a mean between these extremes; partially lacerated, stretched or torn crucial ligaments and in direct degree their slackness will the injury to the internal semilunar cartilage vary. The greater the slackness the less the likelihood of injury to the cartilages. The second question, concerning the median incision as the operation of choice removal of the semilunar cartilage—if the clinician is absolutely certain in his own mind of the diagnosis of a located semilunar cartilage, then he will do better to open through the small local incision. The patient will get better sooner. If, on the other hand, the surgeon is not so certain or the knee-joint is not well after he has removed the internal semilunar cartilage, it is wise for him to decide on exploration of the knee-joint through the larger median incision. With regard to satisfaction after operation for semilunar cartilage, I would like to add a word of warning, namely operation on the knee-joint gives a certain amount of operative stiffness and limitation of movement which it takes weeks or months to pass off. This postoperative stiffness gives to the patient an impression of strength in the joint. Shortly after operation patients will tell you that they have a stronger knee. If you see these people, say a year or half after operation, some of them will tell you quite a different tale. So that in deciding whether a case is satisfactory or unsatisfactory it is well to wait at least a year before making that decision.

The Individual Responsible.—That which is a common concern to all is very generally neglected. The energy which is stimulated by that which depends on himself, of which he only is to reap the whole profit or which concerns common to him with others he employs as much attention and activity as his neighbor requires. He neglects that of which he thinks others take care, and as other men prove equally negligent, his own interest is universally abandoned.—Aristotle

In experiments on the intact animal under ether or chloretone anesthesia I found that the injection of sodium tartrate in various concentrations, from 2.5 to 10 per cent. and 20 per cent., the force of the heart was considerably decreased. The frequency was slightly diminished or remained unchanged. One c.c. per kilo of a 10 per cent. solution caused a marked decrease of amplitude. But in some experiments smaller doses produced the same effect. In one dog

pressure was moderately increased in most instances when ether anesthesia with morphin or curare was employed. No effect with tartrate on blood-pressure was observed when chloretone was employed as an anesthetic. Oncometric measurements of the kidney have invariably shown considerable increase in volume. Attention may also be called in this connection to some observations with calcium chlorid. The antagonistic action of calcium and the oxalate has been shown by a number of investigators. Some workers explained the action of the citrates and tartrates by the chemical property of these substances to form calcium compounds that are insoluble or are not dissociated. Experiments with a calcium chlorid solution have shown that it is antagonistic to sodium tartrate, as it counteracts the effect on the heart as well as on blood-pressure.

The effect of sodium tartrate on the isolated heart has been studied by Karczag,⁶ who made experiments on the heart of the turtle. He reported that hundredth-normal tartaric acid in Ringer solution produced heart-block and decreased cardiac action. Gros⁷ recently reported experiments showing that tartrates also produce depression of the frog heart. I have carried out a systematic study on the isolated heart of the dog, cat and frog. Sodium tartrate, even in very dilute concentration, was found to be a cardiac depressant. A solution of three-hundredth-normal perfused through the frog's heart for from thirty to sixty seconds produced a distinct though not a very pronounced diminution in amplitude. With the increase of the concentration there was greater decrease in the action of the heart which was not, however, proportional. A solution of hundredth-normal decreased the amplitude 40 per cent. After perfusion for the same length of time with a tenth-normal solution the effect was a little more than twice as great. The action varied also with the length of time perfused, cardiac depression being more marked when larger intervals were employed. No adequate explanation of the action of sodium tartrate can be offered at present. Although our experiments show very decidedly the antagonistic effect of calcium under certain conditions, it utterly fails to account in some cases for the action of sodium tartrate.

I am very much indebted to Mr. Selig Hecht, Graduate Scholar, Harvard University, for valuable assistance in some of the experiments of this investigation.

6. Karczag: *Ztschr. f. Biol.*, 1909, liii, 218.

7. Gros: *Arch. f. exper. Path. u. Pharmacol.*, 1913, lxxi, 397.

The Limitations of Statistics.—A series of hundreds of operations, tabulated and arranged and nicely rounded off in terms of percentages, always seems to me to possess but very limited value, so limited, indeed, that it is strictly confined to one person—the surgeon who performed the operations; and even he can learn nothing from the contemplation of his tables when he has compiled them. The rich experience he will have gained cannot even be expressed in that way; much less can it be imparted to others, for it will consist actually in the sum of a multitude of observations of individual cases, all of them slightly varying one from another, but all of them obeying pathological laws which are fixed, and which never vary. After all, it is not the fact of performing a large number of operations that in itself constitutes real experience, unless in addition the surgeon who performs them possesses the qualities that are essential for a good clinical observer.—R. Hamilton Russell, *British Medical Journal*.

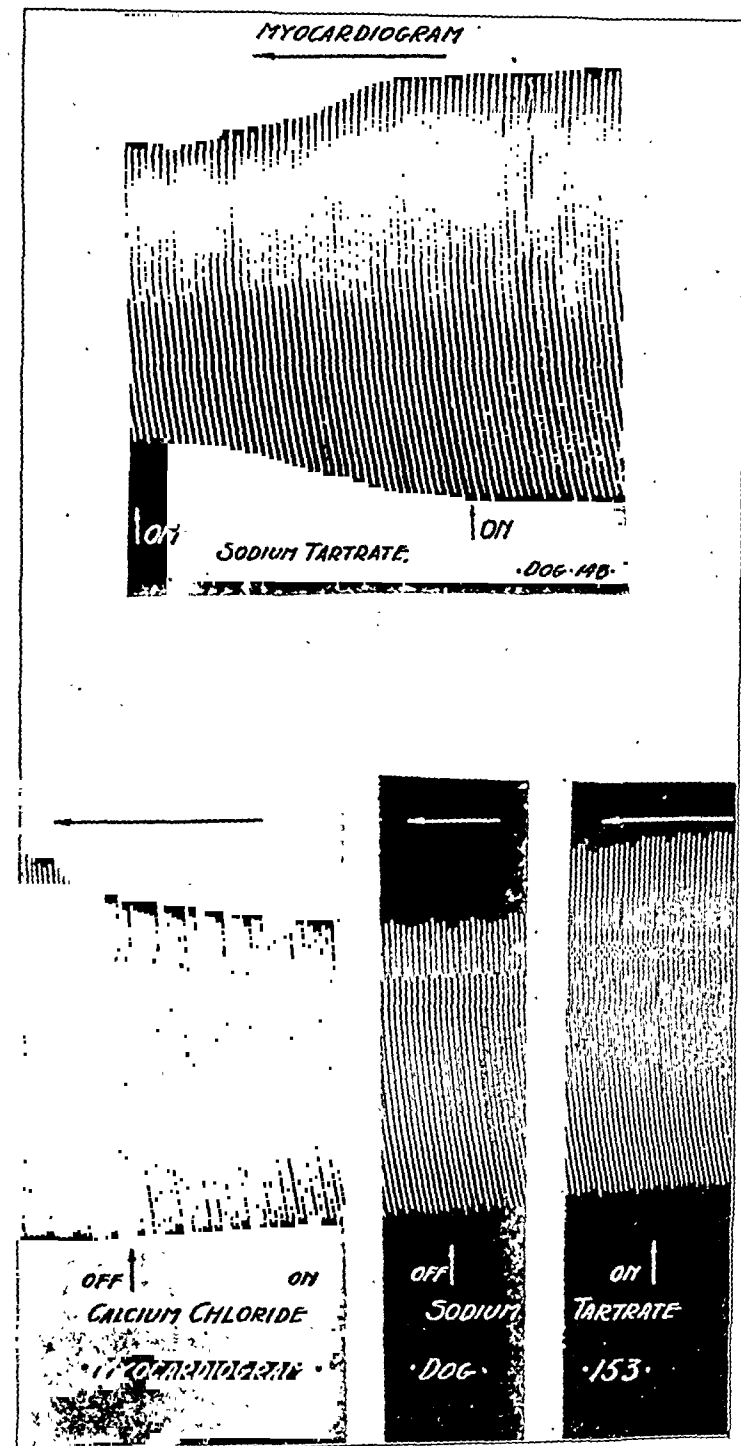


Fig. 3.—Upper tracing shows the depressing effect of sodium tartrate on the heart, the record being taken by means of a Cushny myocardiograph, with the heart *in situ*. Lower tracing shows the antagonistic action of calcium chlorid and sodium tartrate when injected intravenously. Dog under chloretone anesthesia.

weighing 9 kilos, the intravenous injection of 15 c.c. of a 2.5 per cent. solution of sodium tartrate under chloretone anesthesia produced a decrease of 25 per cent. in the amplitude of the heart as measured by a Cushny myocardiograph. Recovery was the rule in our experiments. The rate of injection had an appreciable effect. The more rapidly the solution was introduced the more marked was the depression. Blood-

STUDIES IN INTESTINAL OBSTRUCTION

WITH A REPORT OF FEEDING HETEROLOGOUS
JEJUNAL AND ILEAC CELLS TO A
HUMAN BEING*JOHN WILLIAM DRAPER, M.D.
NEW YORK

To Roger we are indebted for the present conception of the cause of death in intestinal obstruction. He was undoubtedly the first to conceive of it as a true auto-intoxication.

In a paper read before the Johns Hopkins Medical Society seven years ago and based on a study of the effects of 400 duodenal obstructions produced in animals at the Surgical Research Laboratory at Columbia, I reported corroborative evidence, from a surgical aspect, of Roger's view. William Welch on opening the discussion of my paper said that, if corroborated, the facts presented would show that the duodenum had a function hitherto unknown and one evidently of the utmost importance in medicine. It is gratifying that this corroboration has just recently come from Dr. Welch's own laboratory at the hands of Whipple and his associates. By a series of skillfully devised experiments, these investigators have succeeded in casting much more light on this interesting problem than either Roger or I had been able to do, and the sum of our investigations taken in the aggregate seems now to offer incontrovertible proof that the cause of death is not bacterial in origin, but truly autotoxic from the cells of the epithelium of the intestine itself.

Perhaps no branch of medical research better illustrates than this one the advantages derived from having men with one object in view working at different centers of education toward the solution of a common problem. The different points of view ultimately arrange themselves on convergent lines so that when the answer is finally won it is evidently not the product of one man's aims or ambitions, but a homogeneous unit, resulting from the constructive work of several minds. For no single individual can expect to do much more with a modern problem than to advance it a single step. This problem also serves to demonstrate the rapid breaking down of the traditional barriers between medicine and surgery, forecasting the ultimate fusion of these old and arbitrary subdivisions into a new unit, the members of which will have a working knowledge of physiologic chemistry and its allied sciences in addition to requisite technical skill. Furthermore, it demonstrates that modern surgery, like physiology, does not consist in the manufacture and use of instruments of mechanical precision but in philosophical interpretation of natural phenomena.

The various old and groundless theories as to the cause of death in intestinal obstruction have one by one been disposed of, with the possible exception of the exact origin of the toxemia. Is it bacterial, or

purely autotoxic from the cells of the intestinal epithelium itself? Were it not for the views of F. Murphy, which result from his studies at the Washington University and which bear evidence favorable to the bacterial theory, one would be ready to accept the result of the painstaking and thorough researches at the Cornell laboratories of Hartwell and Hoguet who seem definitely to have excluded the anaerobes, and of Whipple and his associates at the Hopkins laboratories, who are disposed to rule out all bacteria as causative agents in the development of the toxemia. From the prosaic and common sense point of view of applied surgery, it is hard to understand why obstruction in the duodenal region should be many times as dangerous as obstruction in the colon. It has long been known that duodenal contents may be allowed to escape into the peritoneal cavity without danger, but that peritonitis is to be expected if any colonic contents escape.

No careful observer could watch the death of a series of duodenally obstructed dogs without noticing the close similarity between the ante-mortem symptoms of this condition and those seen after parathyroidectomy or long remain in doubt that the function of the liver was greatly impaired in each.

The accompanying tables are based on the study of the urine of duodenally obstructed dogs, both

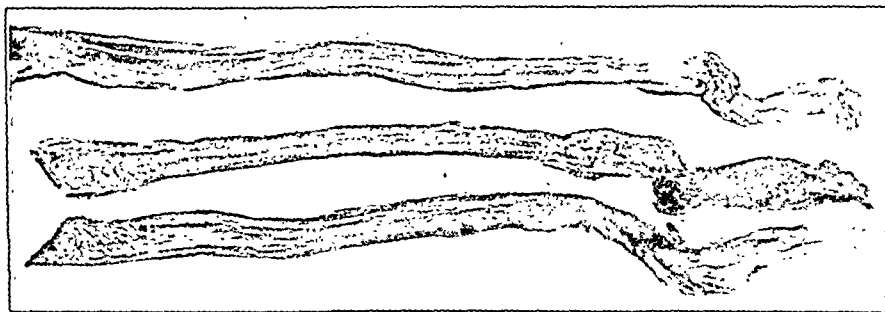


Fig. 1—Above, the split colon of a normal dog; in the middle, the split colon of a dog salivated for four days by pilocarpin, and below the split colon of a dog dying from acute duodenal obstruction.

before and after a large dose of camphor had been given hypodermatically. The recovery of the paired glycuronic camphor has been made by the method devised by Tollens. I am indebted to Frederick W. Schlutz of the University of Minnesota for the privilege of presenting these results, which are a chronicle of his chemical studies made on dogs obstructed by me. In a previous communication we have jointly presented two similar studies, both of which appear to show more conclusively than the present ones that liver function was impaired. Negative findings, reported of carefully wrought work, are, however, just as valuable as positive findings, particularly in the case of a method which is as yet open to some question as to accuracy, and which is certainly open to criticism as regards the time taken in working it out. Dr. Schlutz is carrying on further studies of the accuracy of Tollens' method. As indicated in Table 1, the discrepancy between this report and our previous findings, in which the liver function, as indicated in terms of camphor-glycuronic was considerably lowered, may be due either to inaccuracies in the method itself or our application of it, or to the fact that we were unfortunate in having one of our live but a very short time while the other one an unusually long time. Dr. Schlutz will

* From the Laboratory of Experimental Surgery, New York University.

* Read before the Section on Pathology and Physiology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

ther report which will clarify this interesting question.

When Hartwell and Hoguet advanced their hypothesis that water privation was the chief lethal factor after intestinal obstruction, at the suggestion and with the help of George Wallace we conducted some experiments to determine the exact water percentages in the tissue of dogs under various conditions. It was thought that salivation by pilocarpin, fasting, and duodenal obstruction might cause approximately the same water-loss to the tissues. Table 3 shows the results from six tissues, namely, liver, lung, heart, kidney, spleen and muscle. It is seen that within a few tenths of 1 per cent. the water-loss after pilocarpin, after fasting, and after death from duodenal obstruction was the same, namely, 10 per cent. In the case of the salivated dogs and the fasting dogs, euthanasia was practiced on the fourth and seventh day, respectively, long before there were any signs of disability. On the other hand, the duodenally obstructed dogs were allowed to die of their autotoxemia, so Table 3 gives the maximum water-loss for obstruction but not for salivation or for fasting.

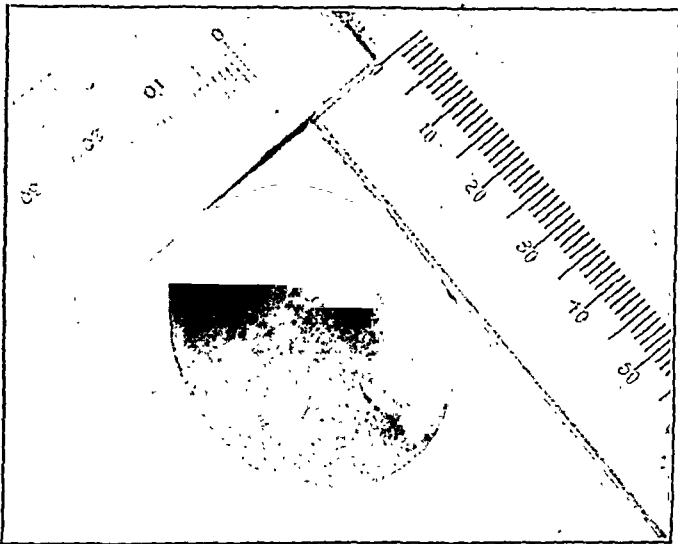


Fig. 2.—Acute jejunal obstruction in dog. Stone swallowed six months before operation, causing chronic stomach symptoms, but no obstruction until it slipped into the bowel. Note partial digestion of soft area by gastric juice. Recovery followed removal of pebble and feeding of dog with jejunal and ileac epithelium.

These studies appear to offer additional proof that in intestinal-obstruction toxemia, as in other toxemias, whether bacterial or truly autotoxic in origin, the solvent power of water on the toxins and its help in eliminating them from the body serve in many cases to prolong life, and, under certain conditions, to save it. Indeed, Wallace has shown that an animal may be given double the lethal dose of diphtheria toxin and yet live, if treated by abundant hypodermoclysis. But while valuable from a therapeutic point of view they cast no light whatever on the origin or the nature of the toxins. Furthermore, it has been the clinical experience of all surgeons that even an abundance of water will not serve to save the life of a human being in whom there had existed for any length of time complete duodenal obstruction.

We have again subjected to careful microscopic study the liver, heart and kidneys of a large number of obstructed animals and find that except for capillary dilatation they appear normal. In this connection as well as in the conduction of the feeding experi-

ments, I acknowledge the efficient help of Dr. Eisberg. These microscopic findings are simply corroborative of previous reports made by myself and others. The beginning and end of the alimentary canal, however, on its epithelial surface, shows this capillary dilatation so markedly as to attract the eye on gross examination. I have shown a colored photograph of a stomach removed from a duodenally obstructed dog at the Mayo Clinic. I have shown and called attention to this before, without knowing its importance or significance; and because of its bearing on certain data which I shall present later, I am glad to say that the observation is corroborated by Whipple. In our necropsy experience the small intestine has shown little if any, gross change, but the colon is almost invariably affected and in a very characteristic manner. I understand from Wallace that the same condition obtained after a lethal dose of diphtheria toxin had been given.

TABLE 1.—INTESTINAL OBSTRUCTION, DOG 201: LIVER FUNCTION IN TERMS OF GLYCURONIC CAMPHOR (TOLLENS), SCHLUTZ-DRAPER SERIES

Date of Experiment	Length of Period, Hrs.	Vol. of Urine, c.c.	Normal Amt. of Glycuronic Acid	Amt. actually Passed as Combined Camphor Glyc. Acid	Increase Over Normal in Glycur.	Remarks
1-27-28	24	130	0.1794	.....	.....	2 gm. of camphor.
1-28-29	24	122	0.1092	.....	.....	A Theoret. total of 452 gm. Comb. camph. glyc. acid. 37.02 per cent. combined before, 5.64 per cent. obstruction.
						Camphor 2 gm. hypod. 3 p. m.
1-29-30	24	147 1/2	0.1470	0.4428	0.2958	1 c.c. of normal undiluted urine = 0.0010 gm. glyc. acid.
1-30-31	24	215	0.2150	1.4094	1.1944	1 c.c. of normal diluted urine = 0.00028 gm. glyc. acid.
1-30-11-1	25	227	0.2270	0.4104	0.1834	
						Intestinal obstruction, 3 p. m. 7-1912; 24 hrs. later 2 gm. camphor hypodermically.
11-1-2	34	900	0.9200	1.1772	0.2572	

Discrepancy with results previously reported may be due to short post-operative life or to inaccuracy of Tollens' method.

Thus it appears increasingly probable that the toxins of intestinal obstruction are eliminated both from the stomach and from the colon. When we recall the method of elimination by the stomach of morphin, its reabsorption by that organ and the value of frequent stomach-washings in the treatment of morphin poisoning, the post-mortem picture of intestinal obstruction is not so surprising, and the value of lavage and epithelial cell feeding in complete and incomplete obstruction as well as in acute dilatation of the stomach is more easily understood. It strongly suggests that most cases of postoperative dilatation are due to an adynamic duodenum, just as hydro-nephrotic dilatation of the kidney is often caused by physiologic ureteric obstruction. An organ dilates first at the point of obstruction to its outlet, be it obstruction mechanical or physiologic.

The capillary evidence of stomach elimination affords a working hypothesis on which we may

explain the interesting results of feeding to duodenally obstructed animals the epithelial cells from the ileum and jejunum of other animals. Table 4 shows the result, as regards the length of life, to be quite definite, the fed dogs living nearly twice as long as the controls. This series agrees with a similar series reported by me from the Mayo Clinic. It is not to

TABLE 2.—INTESTINAL OBSTRUCTION, DOG 202: LIVER FUNCTION IN TERMS OF GLYCURONIC CAMPHOR (TOLLENS), SCHLUTZ-DRAPER SERIES

Date of Experiment	Length of Period, Hrs.	Vol. of Urine, c.c.	Normal Amt. of Glycuronic Acid	Amt. actually excreted as Combined Camphor, Glyc. Acid	Increase Over Normal in Glycur.	Remarks
1-27-28	24	116	0.1458	.....	.....	1.7 gm. camphor = a theoret. total of 3.842 gm. = comb. camph. and glyc. acid. 0.2 gm. camphor = 452 gm. comb. camphor and glyc. acid.
1-28-29	24	150	0.1548	.....	.....	
1-29-30	1.7 gm. camphor in oil subcut. 24	83	0.0913	1.2294	1.1381	Before obstruc. 44.56 per cent. of camphor comb. with glyc. acid. After obstruc. 47.64 per cent. were comb., but practically all in the first 24 hrs. after that markedly dim. function.
1-30-31	24	100	0.1100	0.3582	0.2482	
1-31-2-1	24	130	0.1430	0.2880	0.1450	1 c.c. of normal undiluted urine = 0.0011 gm. glyc. acid.
Intestinal obstruction 4:30 p. m. 2/1/12						
2-1-2	24	55	0.0615	0.2424	0.1809	Camphor 2 gm. subcut. 2/2/12, 2 p. m.
2-2-3	24	366	0.4026	2.3100	1.9074	
2-3-4	24	109	0.1199	0.2310	0.1111	
2-4-5	24	246	0.2706	0.2906	0.0200	
2-5-6	24	134	0.1474	0.2208	0.0724	
2-6-7	24	85	0.0935	0.1140	0.0205	
2-7-8	24	60	0.0660	0.0888	0.0228	

Postoperative life unusually long may indicate high liver resistance or inaccuracy in Tollens' method.

be forgotten that scrapings from the frog's duodenum will stimulate pancreatic secretion in the higher vertebrates. Intercellular reactions must be among the most ancient and most fixed of our functions, and the feeding of intestinal cells may prolong life by reestablishing certain vital intercellular reactions which the obstruction had interrupted. Although

knowing empirically that if jejunal and ileac epithelium were placed in the stomach of a duodenally obstructed dog, that dog would outlive one either not fed on cells at all or fed on cells of organs other than the small intestine. I could not previously understand this but it now seems probable that since the toxins are undoubtedly thrown out into the stomach they are directly rendered harmless by the heterologous cells from the small bowel derived from a healthy animal and are thus prevented from reentering the body. This explains the immediate benefits derived in the treatment of acute dilatation of the stomach and since this condition is undoubtedly due to physiologic duodenal obstruction, it seems probable that the feedings of these epithelial cells may prove to be just as useful in the treatment of dilatation as in the postoperative treatment of obstruction.

The study of Table 4, constructed from the last series, shows that it differs from the former series in that the pulse-rate of the different groups has been unaltered. A reasonable explanation of this is that the pulse was taken in the recent series at the femoral, whereas in the series reported from Rochester it was in each case taken at the apex. The femoral count is certain to be much lower when the heart is running high because many of the beats are not transmitted to the finger. While this series for the foregoing reason shows little change in the pulse-rate, it does show a much greater increase in the length of life, and this certainly is the best index of the effect of any treatment.

A glance at Table 4 shows that of the dogs fed with epithelium only two died before the hundredth hour, whereas of the controls only three lived beyond the hundredth hour. It is interesting to note that one of these lived 239 hours, showing that occasionally one finds an animal naturally resistant to duodenal obstruction. In the average this is balanced in the fed series by one which lived 284 hours, so that the general average remains unchanged and it is quite safe to say that the increase of life, which in this series is nearly doubled, is due entirely to the detoxicating effect of the epithelium.

In order to show that fed jejunal and ileac epithelium exercise some special detoxicating power not yet understood but definitely recognizable, we fed a control series of dogs on the emulsified cells of liver, spleen, pancreas and muscle-tissue. These animals lived a few hours longer than the not-fed controls, but it is evident that these cells had either no detoxicating action, or a very feeble one, compared with the intestinal epithelium. If we prove to have at hand

TABLE 3.—WATER PERCENTAGES OF SALIVATED AND DUODENALLY OBSTRUCTED DOGS ACCORDING TO TISSUE; SALIVATED SERIES, EUTHANASIA FOURTH DAY; FASTING, EUTHANASIA SEVENTH DAY; OBSTRUCTION SERIES, AUTOTOXIC DEATH ON FOURTH DAY (AVERAGE)

Tissue	Normal					Salivated (Pilocarpin)			Fasting 7 Days	Duodenally Obstructed					
	Dog	211	193	236	Aver.	205		Aver.	204	207	206				Aver.
Liver..	73.6	72.0	70.0	79.2	73.7	74.8	60.0	67.4	62.6	59.0	60.6	69.0	68.0	71.0	65.5
Lung..	....	80.4	68.2	84.3	77.6	71.2	79	75.1	76.8	72.8	66.8	....	....	....	69.8
Heart..	77.0	77.0	84.0	75.0	78.2	73.0	63.0	68.0	74.8	74.4	62.0	55.0	75.0	77.0	68.7
Kidney..	....	78.7	80.0	74.5	77.4	75.2	....	75.2	70.9	67.2	59.3	....	74	78	69.6
Spleen..	....	76.3	77.5	74.1	75.9	....	51.0	51.0	....	64.5	....	....	74.0	79.0	72.5
Muscle..	75.0	74.0	75.1	72.7	74.2	44.2	74.0	59.1	45.6	42.8	40.0	65.0	69.2	....	54.2
Average	....	....	....	....	76.1	....	....	66.0	66.1	....	....	....	....	....	66.7

Salivation, fasting and duodenal obstruction each cause 10 per cent. water loss, showing this factor to be negligible in death by obstruction.

some less cumbersome method than Tollens' for determining liver function, it would be interesting to use it as an index of the effect of feeding small intestine epithelium.

I have utilized jejunal and ileac epithelium clinically in two instances. First in a valuable female dog which had been imported from England about six months before, and had had "chronic stomach trouble" ever since her arrival. She, however, whelped a large litter of pups about six weeks before I saw her, without difficulty. She was a large poodle, weighing about 40 pounds. She had had complete intestinal obstruction for five days and she presented all the clinical symptoms which I have described, notable tachycardia, extreme nervousness, and great weakness in the hind extremities. On opening her, with the consent and on the advice of Dr. Blair, I removed from the oral portion of the small intestine and at a point not exactly determined, the pebble which is shown in the illustration. Her condition was very grave, the pulse running from 180 up and showing great irregu-

were given until the entire epithelium from the two animals had been taken. The patient objected much more to some magnesia which we ordered, than to the dose of epithelium, which he described as "not half bad." The pulse improved and the patient lived. These cases prove nothing; they simply show that heterologous cells may be given without discomfort or harm.

Different operative procedures were used in each. In the first, the continuity of the bowel was reestablished and most of the pent-up products of obstruction were allowed to flow to the aboral portion of the intestine. In the second, owing to the patient's condition, it was found necessary to do an ileostomy, and all the obstruction products were drained to the surface. As I have already stated, it is by no means proved that because such products are toxic to other individuals, they are necessarily toxic to their host.

CONCLUSIONS

The power of the liver to pair camphor and glycuronic acid is probably seriously impaired after duodenal obstruction. This can be studied by the method of Tollens, which, however, is cumbersome and may be faulty. Such decreased power of camphor-pairing is presumably an evidence of impaired liver function. This, however, is not reflected in the histologic appearance, either grossly or microscopically.

The decrease in the water-content of the tissues in duodenal obstruction is about the same as obtains after salivation by pilocarpin for four days or after fasting for seven. As this decrease produced no visible change in either case before euthanasia, it is reasonable to believe that it produces none in intestinal obstruction. The loss is 10 per cent.

The toxemia in duodenal obstruction undoubtedly arises from an interference with cellular reactions of the intestinal epithelium. The toxins undoubtedly are at least in part eliminated from the stomach and colon. If small-intestine epithelial cells of healthy animals are placed in the stomach of duodenally obstructed animals, such animals have lived nearly twice as long as not-fed control animals. This evidence is strongly opposed to the bacterial theory of origin of the toxins.

In addition to the placing of jejunal and ileac epithelium in the stomach of postoperative obstruction cases, an emulsion of them should also probably be used in colonic irrigations for the same indication and purpose.

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ABSTRACT OF DISCUSSION

DR. JOSEPH COLT BLOODGOOD, Baltimore: Dr. Draper's paper seven years ago made me think clinically about the duodenum in relation to some things we had observed in intestinal obstruction. In the beginning of surgery, we were dominated by anatomy, and then followed pathology. At present surgery does not look for much help to anatomy, except in certain regions, or even to pathology. We have about reached the limit of the microscope, but we do look for help to experimental physiology in the solving of problems which will be met on the operating-table. Perhaps, later, we will look to experimental chemistry. Surgeons, as soon as they conquered technic in surgery of the stomach, found that their patients did not die of peritonitis. As soon as they used anesthesia, the majority of their patients didn't die of shock and later of anemia, but up to the present there is one complication which has always bothered. If they do a posterior gastro-enterostomy a number of their patients vomit

TABLE 4.—FEEDING HOMOLOGOUS CELLS TO DUODENALLY OBSTRUCTED DOGS

Fed Jejunal and Ileac Epithelium			Fed Emulsified Liver, Spleen, Kidney, Pancreas and Muscle Tissue			Not Fed (Controls)		
Dog No.	Hours Lived After Obst.	Average Pulse	Dog No.	Hours Lived After Obst.	Average Pulse	Dog No.	Hours Lived After Obst.	Average Pulse
200	197	157	49	72	156	185	83	149
202	114	147	53	115	140	186	239	109
204	171	161	56	75	149	188	66	133
33	166	200	57	71	179	189	50	167
34	94	136	58	147	155	191	126	174
38	284	182	63	74	171	192	53	134
48	72	144	64	52	163	193	108	170
44	191	140	65	47	140	196	68	154
45	101	150	62	144	181	197	72	141
46	258	143	59	247	140	198	20	172
1648 164.8*			1044 104.4†			885 88.5§		
1560 156‡			1574 157.4¶			1563 156.3||		

* Average hours of life when fed epithelium.
† Average pulse when fed intestinal epithelium.
‡ Average hours of life when fed emulsion of organs.
§ Average pulse when fed emulsion of organs.
|| Average hours of life of control.
|| Average pulse of control (at femoral).

larity at the apex. She was immediately put on small intestine epithelium derived from two dogs of a different breed. No one is justified in drawing any deductions from one case, but from a long experience with the symptoms of duodenally obstructed dogs, I should not under ordinary conditions have expected her to recover. The symptoms, however, gradually subsided and she lived.

The second instance in which I have used the epithelium therapeutically was in the case of a man referred to me by my colleague Jerome Lynch. The patient had had definite symptoms of obstruction for ten days, and when the abdomen was opened, an annular cancer was found which closed the terminal ileum. Not knowing whether heterologous epithelium would have any detoxicating effect, but remembering that the duodenal epithelium of frogs is capable of stimulating pancreatic secretion in the higher vertebrates, and realizing that this patient was in a desperate condition, Dr. Lynch and I decided to feed him the emulsion from a dog. Hourly doses

the contents of the duodenum, because of some fault in the technic. Now its contents are washed out with the stomach-tube. These patients in the beginning died because we didn't know how to use the stomach-tube. There was no place for the duodenal contents to flow. They couldn't pass up into the stomach and couldn't come through the anastomosis because it was kinked, and these patients died within from three to five days. When I heard Dr. Draper's paper I couldn't understand some of the mortality after operations of that kind, either of my own or others. Patients going well on the operating-table, apparently absolutely comfortable for twenty-four or thirty-six hours, suddenly going to pieces, with no pumping, no distension or rapid pulsing that show in intestinal obstruction. That is a definite case of death from acute dilatation of the duodenum as a definite postoperative complication. If there is a patent pylorus we can relieve that with a stomach-pump when the pylorus is closed by section. Some surgeons are now advocating that posterior gastro-enterostomy is without an element of danger, and will not be followed by complications in two or three days. The operation has led to chronic dilatation of the duodenum, a terminal condition which is responsible for the ill-health of a group of patients. In the last three years I have recognized and operated on six. In the previous three years I didn't recognize three. The previous three died. The subsequent six have recovered, and the cause of the dilatation I have found has been a congenital defect in the mesentery to the ileum from the appendix and the giant cecum descending into the pelvis, and on account of the short mesentery of the ileum lying directly on the base of the mesentery section, which kinks the small intestine as it passes through to a junction with the duodenum, which produces a chronic dilatation with its symptoms. These patients have been relieved by removing the colon and taking away that heavy part and exposing the transverse colon so that it will do its work and be allowed to expand. This is a demonstration of what experimental physiology can do for practical surgery.

ROVSING'S OPERATION FOR CONGENITAL CYSTIC KIDNEY*

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My first acquaintance with congenital cystic kidney was gained in the dissecting-room of the Boston City Hospital, where I saw several necropsies on patients of middle and adult life who had come into the hospital in convulsions and died of uremia. In some of them, the enlargement of the kidneys had been noticed before death; in others, not, but at the necropsy the kidneys were found very much enlarged and studded with numerous cysts ranging in size from a pea to an orange. These cysts were yellow, green, red and brown, and the effect was very beautiful, making a pathologic specimen truly remarkable and imposing in appearance. These necropsy cases were bilateral, one kidney being considerably more enlarged than the other.

Cases in which gradual enlargement of a polycystic character takes place in middle life, and in which the patients present themselves to the surgeon on account of dragging pain and the presence of a tumor in the loin, or possibly on account of the mobility of the enlarged kidney, may suggest malignant disease of the kidney or hydronephrosis; and it is frequently only when they are cut down on that their true nature is revealed and the importance of a knowledge of their

nature and treatment becomes evident. Such kidneys have not infrequently been removed, with the result that the patients have died of uremia, and the necropsy has revealed the presence of cystic disease of the other kidney, usually less advanced, so that a tumor was not felt before operation. A knowledge of the fact that this disease is usually bilateral might have saved the patient's life and the surgeon's discomfiture.

Congenital cystic kidney is a disease which frequently runs its course without a diagnosis being made during life, death occurring from uremia or cerebral hemorrhage due to kidney insufficiency. The real cause of the insufficiency is first discovered at the necropsy, when the enlarged cystic kidneys, not felt during life, are found by the pathologist. In fact, the course of the disease may be so latent that a patient in whom pathologic changes have not been suspected may be stricken with uremia or cerebral hemorrhage.

The term "congenital cystic kidney" does not include hydronephrosis, which is a dilatation primarily of the pelvis and sinus of the kidney from retention due to obstruction in the pelvis itself or the ureter, and does not concern the urinary tubules at all. It does not include cystic dilatation of the tubules due to contraction of the interstitial tissue, which sometimes accompanies a chronic interstitial nephritis. Here the kidney cortex becomes studded with little cysts, seldom larger than a pea, and not, as in the true congenital cystic kidney, greatly enlarged and varying in size. The cysts in interstitial nephritis play only a subordinate rôle and are secondary to scar contraction. Neither does the subject under discussion include the single or occasionally multiple cortical cysts which sometimes result from the absorption of embolic infarcts. In the true cystic kidney the organ may be enormously enlarged; for example, the cases in which they present an obstacle to parturition or in adults occupy half or two-thirds of the abdominal cavity. The whole organ, both cortex and medulla, is studded with cysts of various sizes, from that of a pin-head to that of a mandarin orange. The surface is knobby with cysts of different size and color. The walls of the cysts are thin and vascular, and the larger ones show folds on their inner surface, which are the remains of the walls of the smaller cysts which have coalesced to form them. The fluid consists of urine, since in it are found urinary constituents, such as uric acid and hippuric acid, calcic oxalate, cystin, leucin, and tyrosin; but in the larger cysts, this fluid is considerably diluted (probably by serum which has transuded through the walls), is albuminous, and contains blood, pigment, fat and cholesterin, in varying quantities, so that the color of the cysts may be red, brown or yellow, and the fluid in them more or less cloudy. Between the cysts are often found more or less extensive areas of normal renal parenchyma; other cysts are separated merely by fibrous tissue. In some cases with large amounts of parenchyma, we cannot distinguish between cortex and medulla.

The efferent passages, which protrude into the calices or pelvis frequently show no changes, but in some specimens are shrunk and narrowed, and may be almost obliterated. Thin-walled cysts may sometimes be seen projecting into the pelvis, just as they do on the outer surface of the kidney. Microscopically, each cyst is lined with a single layer of flat epithelial cells, which in the smaller cysts correspond closely to a tunica propria. In the larger cysts this is not found, either because they have no proper wall, or because

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the cysts appear as dilatations in the interstitial tissue. The partitions between the cysts are so thin as to make it probable that the larger cysts have been formed by the coalescence of smaller ones. In some of the smaller cysts, glomeruli have been found attached to the walls, and flattened, but still permeable to injected fluid. It is thus evident that all portions of the tubular tract, from the glomeruli to the terminations in the papillae, are subject to cystic dilatation. The suggestion of certain investigators that these dilatations may arise by cystic degeneration of the interstitial tissue is not supported by recorded observations. That certain of the cysts show no epithelial lining is due to the fact that the epithelium is desquamated and disappears. In the smaller or younger cysts the epithelium is always found.

Cystic kidneys in adults and in the new-born are usually bilateral. If, as is rarely the case, the disease is unilateral, the other kidney is hypertrophied. The degeneration of the kidney may have an unfavorable influence on the development of the fetus, so that birth is premature. The child may die within a few moments of birth from respiratory failure, because of the interference with the movements of the diaphragm consequent on the tumor, or may live a few days, only to succumb to the same cause. Death may result early in these cases from renal insufficiency, the amount of normal functioning renal tissue between the cysts being insufficient for excretory purposes. On the other hand, the amount of normal renal tissue may be sufficient to prolong life for indefinite periods, perhaps decades, before renal insufficiency results in death. The most favorable conditions will naturally be presented by unilateral cases with compensatory hypertrophy of the opposite kidney, which unfortunately are rare.

In considering the etiology of this disease, we enter a field which has been fruitful of much discussion. The theory of Neuwerck, Hufschmidt and von Kahliden, that these tumors are cyst-adenomas, is negated, it seems to me, by the fact that the cysts may often be demonstrated to be dilatations of the renal tubules, and contain urine, often diluted with serum, it is true, but showing distinct urinary constituents. The epithelial proliferations and connective-tissue growths, which Brigidi and Severi had relied on as evidence of tumor-growth or adenoma, have been shown by von Mutach to be tissues characteristic of embryonic kidneys. The presence of these proliferations, etc., therefore, is an argument in favor of the developmental rather than the neoplastic origin of the tumors. In order to explain these cases we have to assume, with Orth and others, the existence of some obstruction to the escape of urine from the dilated and cystic canals. The oldest theory, that of Virchow, that the urinary concretions, "uric acid infarcts," so common in the new-born, have plugged the canals, is untenable, since these are rare during intra-uterine life, and after birth so common that cystic kidneys, if due to them, ought to be much more frequent than they are. There seems to be no doubt, as Virchow himself acknowledged later, that we must assume an organic obstruction and actual obliteration of the tubules. Orth agrees with Virchow's later view, that the condition results from a fetal inflammation involving the papillae without resulting in obliteration. He says that the papillary atresia cannot be attributed to a congenital narrowing, because certain embryologic investigations have shown that the tubules are devel-

oped from the wolffian ducts and do not develop separately from them and afterward unite with them. The fact that we find cysts in all parts of the kidney, including the papillae, does not, however, make it necessary to assume that the obstruction must be located in the papillae. The cysts of the upper tubules might extend into the papillary tract and displace the straight tubules and project into the pelvis.

In favor of the theory that the condition is a developmental malformation is the fact that other congenital malformations frequently coexist. The presence of congenital cystic liver in association with cystic kidney, which occurs in 19 per cent. of the cases (Moscowitz), is also significant of the embryonal origin of the condition. The cysts of the liver are ascribed by Moscowitz as due to the obstruction of afferent intracinar bile-ducts, and are evidence also of congenital origin. Other anomalies which have been found associated with cystic kidney are hypospadias, atresia, and absence of ureter, vagina, bladder, etc.; also hare-lip, spina bifida, or absence of extremities. There is now pretty general agreement among investigators that the condition is due to defect in development, which is explained somewhat as follows: The tubular structure of the kidney, including the glomeruli, the convoluted tubules, the loops of Henle and the straight tubules, to a considerable extent, originate by a development of tubules in the mesoderm of the embryo. The ureter, kidney, pelvis and an uncertain amount of the straight tubules in the pyramids develop from a tubular process which originates from the wolffian duct. The straight tubules grow out and meet the primitive vesicle, which becomes the glomerulus; and then later from this glomerulus the convoluted tubules and Henle's loops are developed (Brödel). In case this tubule growing from the wolffian duct fails to connect with the primitive glomerular vesicle, an obstruction occurs, resulting in cystic dilatation of the entire tubular system above the straight tubules. The extent of the process will depend on the relative number of tubules that fail to meet. If a large proportion fail to connect, then the cystic formation will be rapid and complete, and, no kidney tissue being left to eliminate urine, the patient will die. If, on the other hand, there be left comparatively large areas of healthy kidney tissue, enough for the elimination of uric acid, the patient may live for years and die from other causes. The presence of the increasing cystic tissue may finally so squeeze the intervening healthy tissue as to cause insufficiency, and the patient dies from this. This theory seems adequate to explain the facts as observed, and to be in every way more probable than that fetal nephritis involves the papillae. This view has lately been adopted by Berner.¹

Bunting, in a careful microscopic study of specimens from two cases, found that in these cases the urinary path could be opened from the glomeruli through to the pelvis of the kidney, and, therefore, added no evidence in support of the obstruction theory or a failure of two sets of tubules to join with each other. He believes that the primary cause of the trouble is the epithelial hyperplasia, which, so to speak, forces out the walls of the tubules. This theory does not satisfactorily explain, however, why we get cystic forms instead of epithelial growths, and needs further confirmation. Whatever theory of cystic kidney be adopted, we cannot help concluding that it is

1. Berner, O.: Zur Zystennierenfrage, Virchows Arch. f. path. Anat., 1913, cclxv, 265.

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a developmental condition, a malformation rather than a new growth. A fact that speaks strongly for the malformation origin is its occasional occurrence in several generations of the same family, showing a tendency to inheritance.

Cystic kidney has oftenest been observed in the middle decades of life, but cases have been reported in the first and second decades as well. In the adult, the pathology corresponds in every way with that of the new-born except that the individual cysts are larger, as are also the entire kidneys. It becomes evident, therefore, that if our explanation is correct, we must assume that in case of cystic kidney in the adult, the condition has existed since birth but has not until later years given rise to symptoms that attract attention.

If our views of the etiology and pathology of the disease as given above are correct, they will furnish us an adequate explanation of the somewhat remarkable symptomatology and course of the disease. The most thorough and careful description of the course and symptoms which I have found is that of Milward of Birmingham, who divides the clinical history of the disease into three stages:

1. The stage of progressive enlargement of one or both kidneys without subjective symptoms. The renal enlargement is discovered, if at all, by accident. This stage may last from a few months to several years.
2. The stage of subjective symptoms and objective signs. This stage lasts from a few months to six or eight years, or even longer. The signs and symptoms are dependent on the size and weight of the tumors.
3. The stage of decreasing elimination of urine. In this stage appear the symptoms of uremia or cerebral complications. It lasts two or three weeks or a few months.

Males and females are affected in about equal numbers. The disease usually terminates fatally in the fourth, fifth, or sixth decade. Renal enlargement is rarely discovered before adolescence, and when the disease develops in infancy, the child hardly ever lives till the tenth year, so that the disease has been rarely reported between the tenth and thirtieth years.

The symptoms noted during the second stage are a dull, aching pain in the region of the kidneys, during both night and day, but usually worse in the daytime, especially if the kidney is movable. A large part of the pain, especially in the later stages, seems to be due to mobility of the kidney. There is tenderness on palpation or pressure, and occasionally the pain may be paroxysmal and very severe, with resulting prostration or examined post mortem present cysts filled with blood under high pressure, it is reasonable to suppose that some of the pain may be due to hemorrhage into the cysts. Occasionally, suppuration has taken place in one or more of the cysts and has required operation. Flatulence, headache, dyspepsia, vomiting, anorexia and constipation are frequently concomitant symptoms. It is an important and somewhat interesting fact that the examination of the urine often throws very little light on the diagnosis, a circumstance which contributes greatly to the difficulty of the latter. During the second stage and until the deformation of their functions almost perfectly. The specific gravity is usually low, below 1.010, and the amount passed is usually slightly increased, but may be diminished. There is usually only a slight trace of albumin, and often albumin is entirely absent. In the second stage,

it is never present in large quantities except when there is a great deal of blood. Casts are practically always present; leukocytes are common and often occur in large numbers. Pus may be present in acid urine. Blood is usually present in traces, and when there is hemorrhage into the cysts, may be poured out in such large quantities as to constitute attacks of hematuria. Bleeding may occur every few months, or once a year, or may never be sufficient to tinge the urine. Some blood, however, is always present, and this is significant (Milward).

The elimination of urea may amount to from 250 to 350 grains until late in the second stage; and it is not unusual when death occurs suddenly (as it often does in the third stage) for the physician to find to his surprise the cystic kidneys.

The symptoms of the third stage are those of uremia or some allied complication, such as cerebral hemorrhage, due to arteriosclerosis, and consist of headache, dyspnea, drowsiness, convulsions, paralysis and coma.

In the majority of cases the symptoms last from a few months to five or six years. Twenty-two and nineteen years, respectively, was the duration of symptoms in the longest cases noted. Ritchie, reporting on eighty-eight cases, found that in seventy-five, the average age at death was 45.3.

Of seventy-eight cases in which the symptoms were analyzed, thirty had renal symptoms apart from albuminuria, twenty having pains in the loins and abdomen. Sixteen had hematuria at some time. Seven had no kidney trouble, and no evidence of illness, but cystic kidneys were found post mortem. Eleven suffered, or had suffered, from edema; in ten the absence of edema was stated. In thirty-three the urine contained albumin, in nineteen a trace, and in eleven a considerable quantity. Vomiting or intestinal symptoms, constipation or diarrhea, was present in nineteen cases. Twenty showed anemia, cachexia or loss of flesh. Thirteen had dyspnea or some pulmonary affection. In twenty-one, tumor was discovered during life in one or both flanks.

A brief review of the literature shows us that those patients who have come under the surgeon's care presented themselves during the second stage for pain in the side, due either to the weight or to the mobility of the tumor. The surgeon finding the tumor operated, and, if it was large and malignant-looking, not infrequently removed it. The patient lived or died according to the presence or absence in the other kidney of sufficient healthy tissue to attend to the elimination of urea.

Several years ago, in cutting down in a case² of movable kidney, I found that I had a case of congenital cystic kidney to treat. I made an incision on the other kidney, and found that also was cystic, so, instead of removing the kidney in this case, I punctured the larger cyst, and sutured the kidney in place, with considerable relief of the symptoms, so that the patient (who was a nurse) was able to go back to work and lived in comparative comfort for many years.

My next experience (Case 4, reported below) was being called to see a woman who was subject to congenital cystic kidney, who had recently had a baby, and following that, had had infection of one of her

2. Lund, F. B.: Congenital Cystic Kidney, *The Journal A. M. A.*, Aug. 18, 1906, p. 479.

kidneys. This had been incised, and from the wound pus was discharging, and she had had a picket-fence temperature for something like six weeks. I cut down on the kidney, and found a congenital cystic kidney, with many of the cysts infected. Inasmuch as she was rapidly running down from suppuration and there was no way of draining all the separate cysts, I removed the kidney, hoping that the other kidney was not too much involved in the disease. She recovered from the operation and got well. When she became pregnant again, symptoms of swelling of the extremities, dizziness, headache, etc., appeared, and she had to have miscarriage induced twice. Then I removed the tubes, and she has been well and happy since—about five years. The other kidney—the right one—can be felt to be considerably enlarged and cystic at the present time, but it is not increasing much in size.

These experiences led me to make a study of congenital cystic kidney, the results of which were published in a paper read before the American Medical Association at its Boston meeting in 1906, from which I have freely quoted.

It is evident from the foregoing discussion that the disease is fatal from compression of the kidney-tissue between the cysts; and that while it may be practically impossible to cure the disease, it might be arrested at any given point if the growth and multiplication of the cysts could be stopped so that the kidney-tissue could be no further compressed between them. This Curtis and Kammerer have attempted to do, and I myself have done it rather inefficiently without knowing of their work, as in the case I referred to at the beginning of this paper. Last year, however, I had the pleasure of a visit from Professor Rovsing, who told me of his results in the treatment of this disease by puncture of the cysts; and under his direction, I was fortunate enough to be able to perform an operation on the right kidney of a patient then in the ward. I have since had the opportunity of the same patient, and on one kidney in each of two other patients, and I am so pleased with the results that I am glad of the opportunity of reporting them.

Rovsing's operation consists in exposing the kidney through the ordinary oblique incision in the loin, and puncturing the cysts on its surface as far as they can be reached by retracting the wound; and it will be found when you try it, that a very large area of the anterior and posterior surface and posterior border of the kidney can be reached. As the cysts are punctured and the contents flow out, the kidney is much diminished in size, and may be so reduced that one pole and then the other may be delivered from the wound. Then, with the kidney held in the left hand, the larger cysts and bunches of cysts may be felt and the hollow needle run into them. Care should be taken to avoid the areas of normal kidney-tissue wherever they can be seen and felt. There will be very little bleeding unless these areas of tissue are punctured. A kidney which is six, or eight, or even ten times the normal size may by this means be reduced until it is of a very decent size, say perhaps twice the size of a normal kidney. Then the kidney can be replaced in the abdomen, and the wound closed without drainage. It seems like a formidable procedure, but it is not so; and the surprising thing about it is, that the kidney not only is of smaller size when it is replaced in the abdomen, but that after a temporary increase in size, it remains small and no longer troubles the patient by its weight and dragging sensations.

Rovsing³ has reported three cases in which this operation was performed. In his first case, reduction in the size of the kidney was permanent, and the albuminuria which was noted before the operation disappeared. The patient lived in comfort for some time, and then died of uremia following fever. In Rovsing's second case, the pain and dragging from an enormous kidney was relieved by this operation, and the patient was well for two and one-half years after the operation. The albuminuria diminished, the urinary excretion tripled, and the urea excretion doubled.

In Rovsing's third case, an enormous kidney was reduced in size, the twenty-four-hour quantity of urine increased, the excretion of urea increased, the patient's appetite improved, and the patient's color became healthy. Rovsing says:

It is to be noted that in these cases, the pain disappeared and renal function was reestablished to a striking degree. . . . There is but one explanation for this unmistakable improvement in the activity of the kidneys. Normal renal tissue is present among the cysts. The pressure of the latter when full and tense inhibits renal function, which is resumed when the mechanical effects of pressure are removed. The improvement of the patient is also thus accounted for. It is not claimed that the disease is cured by the operation, or that its ultimate fatal issue is more than just postponed. The disappearance of the pain, however, the prolonged and striking restoration of renal activity, the simplicity of procedure and the absence of shock after the operation should constitute a sufficient incentive to attempt this treatment as herein outlined in every case of this type.

My own cases go far to bear out the statements of Rovsing in regard to his operation. I will give them as follows:

CASE 1.—M. M., negress, aged 37, married, who had had eight children and five miscarriages, was admitted to the Boston City Hospital in June, 1910. In May, 1912, lumps were found on both sides, which were diagnosed by her physician as kidney tumor. Appetite was good; bowels constipated; no urinary symptoms. The patient had noticed the lumps for three years. She appeared to be well developed and nourished. Heart, lungs and extremities were negative. There was marked enlargement of both kidneys. Function of left kidney was not good, and operation was advised to relieve pressure.

Cystoscopic examination (Dr. Binney) revealed bladder normal and ureters normal; catheterized for 15 cm.

Functional test: Phenolsulphonephthalein: Color appeared from right ureter at end of 25 minutes; from left, ?

Right, first hour, 0; second hour. . . . 5 per cent.
Left, first hour, 0; second hour. . . . 0 per cent.
Bladder urine 18 per cent.

Total 23 per cent.

No function of left kidney; very low normal function in right.

June 24, 1912, I made a left lumbar incision. Kidney was exposed and found enlarged to the size of a baby's head, and to consist of cysts. No kidney tissue was found. The cysts were punctured, with discharge of straw-colored fluid until the kidney was small enough to deliver through incision. I continued to puncture the cysts, both deep and superficial, until the kidney was reduced to twice normal size. It was then replaced, and the abdomen sewed up tight. The patient made a good recovery, but tests made about two weeks after the operation showed no apparent change in the kidney function since the operation. The patient was discharged, July 11, after being told to come back in September for an operation on the other kidney.

3. Rovsing, Thorkild: The Treatment of Multilocular Kidney Cystoma (Congenital Cystic Kidney) by Means of Multiple Punctures, *Am. Jour. Urol.*, 1912, viii, 120.

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The urine examination, July 10, follows:
Pale; cloudy; specific gravity, 1.004; acid; slight trace of albumin; no sugar; much pus; few epithelial cells.

The patient returned to the hospital, April 16, 1913. She stated that after leaving the hospital, last July, she felt weak. Complained of pain "across the small of the back" when bending over or when fatigued. Has slept well; good appetite; no nocturia; no trouble in passing water; has cramp-like pains in left side of neck, left arm, left shoulder, and in left leg; menses regular; no leukorrhea; constipated. During the previous month, the patient had felt considerably weaker, and complained of headache and languor.

On physical examination, the patient presented in right upper quadrant an irregular mass extending to middle line and to level of umbilicus, and above to costal border. The mass could easily be seen with patient at ease, moving with respiration. On palpation with one hand on abdomen over mass and other hand in flank, the mass could be moved about freely, with no apparent pain.

April 17, I made a loin incision. The kidney was found much too big to be delivered through the wound. No good kidney-tissue could be seen; nothing but honeycomb cysts of all sizes could be seen or felt in the kidney. I punctured the cysts with a trocar, and much clear and cloudy fluid (not urine) was withdrawn. After a considerable number of cysts had been punctured and contents evacuated, the kidney was delivered and puncturing of the cysts continued. After reducing the kidney greatly in size, I put it back in position, and closed the wound. Eight days after the operation, the patient was comfortable and passing considerable urine. The mass could be felt, but it was considerably smaller than at entrance, and the patient was discharged May 1.

I saw this patient in the autumn of 1913. She was in good condition, and both kidneys could be felt, but they were not nearly so large as before operation.

CASE 2.—F. S., a woman, aged 35, married, two children, had had a hard time with the first child, and was miserable for five or six years; suffered from anemia; had pain in right side; seemed as if stomach was floating.

Examination showed a very large mass in the right loin extending down on to the brim of the pelvis. The left kidney could also be felt. The mass in the right loin felt as if cystic. Probable diagnosis was made of congenital cystic kidney, and Dr. Loder examined the urine from both kidneys and reported as follows:

Bladder Urine: Very pale. Specific gravity, 1.005. No albumin. No sugar. Neutral. Urea, 0.2 per cent.
Right Urine: Specific gravity, 1.005. Trace of albumin. Urea, 0.2 per cent. Sediment: Blood and epithelium from catheterization. No pus. No casts or renal cells.
Left Urine: Specific gravity, 1.005. Trace of albumin. Urea, 0.3 per cent. Sediment: Blood and epithelium from catheterization. No pus. No casts or renal cells.

Functional Test:
Right: Time, 9 minutes. 84 c.c...22 per cent.
Left: Time 11 minutes. 65 c.c...22 per cent.
Leakage about catheters..... 8 per cent.

Total 52 per cent. (1 hour)
Cystoscopy: Trigon shows numerous small, slightly congested areas, slightly elevated. Right ureteral orifice, negative. Left orifice is encroached on on one lip by one of the above-mentioned minute elevations; otherwise normal in size and motion. Catheters passed without difficulty to kidney.

Conclusion: No infection or tumor of kidney. No impairment of function of left kidney.
At the Deaconess Hospital, Aug. 29, 1912, she was placed in a left lateral position for operation on the right kidney. Then the tumor could not be pressed up into position of the kidney, and some doubt was felt as to the diagnosis. An abdominal incision was therefore made at the outer border of the right rectus for exploratory purposes. The left kidney was found to contain numerous large cysts, and the right kidney numerous cysts of various sizes, and a very large cyst at its lower pole. The patient was replaced in the lateral position, and an incision made from the tip of the twelfth

rib down and forward to the spine of the ilium. The kidney was dissected out and drawn out of the loin. A very large cyst, which must have contained 4 ounces at the lower pole, was opened and cut away. The other cysts all through the kidney were punctured with a trocar and opened with a knife. There was a good deal of healthy kidney tissue between the cysts. The kidney was reduced to about one-third of its former size, and was sutured to the spinal muscles. In puncturing the cysts, the pelvis of the kidney was opened with a knife, and this opening was closed by suture. A cigaret drain was passed into the loin and the wound sutured to it.

The patient had a high temperature for four or five days, and on September 5 I found pus in the lower angle of the wound. I opened it up, and found a cavity containing about 2 ounces opposite the lower pole of the kidney.

After operation, there was a large increase in the amount of urine passed. The patient made a good recovery, and during the winter and spring of 1912-1913 she gained in flesh, color, and general appearance. Oct. 15, 1912, Dr. Loder made a phenolsulphonephthalein test, as follows:

Right: Time, 9 minutes. 35 c.c....24% Urea, 0.4%
Left: Time, 9 minutes. 40 c.c....22% Urea, 0.3%
Leakage 10%

Total 56%
This test as compared with that before the operation shows a doubling of the amount of urea in the excretion of the right kidney.

I saw this patient in June, 1914—that is, nearly two years after the operation—and she is in excellent health. She has good color, and looks much better than when she was operated on. The right kidney (the one operated on) could just barely be felt. The left kidney could also be felt and is a little enlarged.

The urine examination, June 15, 1914, was:
Slightly cloudy; acid. Specific gravity, 1.010. No sugar. Slightest possible trace of albumin. Sediment: Few small round renal cells. No pus, blood or casts.

CASE 3.—C. S., woman, aged 41. One child, instrumental delivery twenty years ago. For about a year, had been growing thin and weak; complexion had become sallow; and she had suffered considerable abdominal pain, especially in the flanks. She had consulted her physician, Dr. C. H. Miller, and sent her to me. He had discovered tumors in both flanks, and on examination, I found her thin and pale. There was very marked enlargement of both kidneys, especially of the left.

Urinary examination by Dr. I. J. Walker, was as follows:
Specimen from bladder: Cloudy. Specific gravity, 1.014. Acid reaction. No sugar. No bile. Slight trace of albumin. Sediment: Some blood; some small and large renal cells; a few bladder-cells; a few leukocytes; no casts.

Cystoscopic examination was as follows: Bladder walls normal in appearance. Right and left ureteral orifices normal in appearance. Flow from right kidney about five times greater in amount than that from left kidney. Specimens showed the following:
Right: Pale. Slight trace of albumin. Sediment: Many small round renal cells, and a few large round renal cells. Rare normal blood corpuscle. Few hyaline casts in about twenty fields.

Left: Much normal blood. Many small round renal cells, and a few large round renal cells. A few leukocytes. One hyaline cast found.
Functional test: Color appeared from right kidney in twelve minutes; from left, in seventeen minutes. Urine collected in one hour showed: right kidney, 20 per cent.; left kidney, 2 per cent.

Rovsing's operation was done at the Boothby Hospital, March 29, 1913: Oblique left lumbar incision. Enormous polycystic kidney found. A very thorough puncture of the kidney was done with a moderate-sized

aspirating needle, running it thoroughly all through the kidney wherever a cyst could be found. The cysts on the surface appeared to extend out into the surrounding connective tissue. By puncturing the cysts, marked diminution in the size of the kidney was made, and it was finally drawn outside the abdomen. When I finished, the kidney was about twice normal size, and about one-fourth the size it was when we started to operate. In puncturing the cyst in the upper pole, a moderate amount of blood was obtained. Having punctured all the cysts we conveniently could, the kidney was replaced and sutured with chromic catgut sutures. A cigaret drain was placed in the lower angle of the wound. The patient bore the operation well.

Before the operation, the patient was passing from 30 to 45 ounces of urine; the following is the report of the urine examination made two days after the operation: Cloudy. Acid reaction. Specific gravity, 1.008. No sugar. No bile. Slight trace of albumin. Sediment: Some normal blood (about 60 corpuscles to a field), a few small round renal cells; occasional large round renal cells; a few bladder cells; rare ureteral cells; much amorphous urates.

The amount of the urine increased; the kidney increased somewhat in size and afterward diminished, and has since remained so it can hardly be felt to have increased in size. The patient has made a considerable gain in flesh, strength, and general appearance. No urethral catheterization has been done since the operation.

I saw this patient in June, 1914, a year and three months after the operation. The left kidney (the one operated on) could just barely be felt. The right is certainly as large as the left was before operation. Her face has filled out, and she feels much better. She is going to come in the autumn to have the other kidney operated on.

Examination of the urine, June 15, 1914: Slightly cloudy. Acid. Specific gravity, 1.006. No sugar. Slight trace of albumin. Sediment: Many bladder-cells. Considerable number of leukocytes. Few small round renal cells. No blood or casts.

CASE 4.—C. J., a young married woman, seen in consultation with Dr. Bateman at the Somerville Hospital, in 1907. Her father had died at the age of 50 with cystic kidneys. She had been trained as a nurse, and had recently married. Four months before, she had had a baby, which was born in normal fashion. After the baby's birth, the patient had had a high temperature and complained of pain in the right side. Three weeks before, a surgeon had been sent for, who found a tumor in the region of the left kidney, made an incision, and found several cysts, some of which contained pus. After the operation, the patient had a temperature from 100 to 103, and suffered pain, although she passed a fairly normal amount of urine.

I found a discharging sinus in the left side, and a large tender kidney on that side. The right kidney was also palpably enlarged. June 29, through the sinus, I found a large kidney studded with cysts of various sizes and colors, some of them containing pus. It had been recognized that suppuration from that kidney was the cause of her symptoms, and that it was therefore necessary to remove the kidney. This was done, the pedicle being sewed with catgut. Considerable pus escaped from several cysts. Her pulse was about 140 during operation. July 2, she was reported in good condition.

I saw the patient again, two years after the operation just reported. In the meantime, she had had to have two abortions done by Dr. Bateman, as she had become pregnant and the condition of her kidneys would not allow her to go through pregnancy. She had recently become nervous and suffered a good deal of pain in the left side of the pelvis. Examination showed the uterus movable. The left ovary could be felt to be prolapsed, and this was thought to cause her pain. Median laparotomy was done. The prolapsed left ovary and tube were removed, and the right tube was removed, the right ovary being left behind. This was done to prevent future pregnancy. The right kidney could be felt very much enlarged and cystic. The patient made a good recovery.

As a result of my experience in these four cases, although it is not a large one, I am inclined to think that Rovsing's suggestion of a thorough, systematic puncturing of all the cysts until the kidney is brought down to near normal size is a distinct advantage to our therapeutics in these cases; and I am inclined to feel that I shall perform it in all cases in which the kidney secretion is not too greatly crippled so that any operation might bring on uremia. I believe that in the present state of our knowledge, it is wise, in case both kidneys are involved, to operate on only one kidney at a time. Even if we cannot absolutely cure our patients and make them as good as if they had never been subject to the disease, if we can relieve them of pain and dragging, as I think it has been demonstrated that we can, improve their health, weight, appearance and color, and practically arrest the disease, it seems to me that we can accomplish a good deal. And we must give to Rovsing the credit for having improved and systematized the method of puncture of the cysts—which had been tried in a half-hearted way by others, including myself—until it has a really distinct therapeutic value.⁴

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ABSTRACT OF DISCUSSION

DR. D. N. EISENDRATH, Chicago: Dr. Lund's paper is an example of what modern pathology has taught us. Formerly we thought that a congenital cystic kidney was only of interest to the pathologist, but now that we have come to see it under various clinical forms, it becomes of great interest to the surgeon. These cases, formerly regarded as absolutely hopeless, are now amenable to such an operation as Rovsing's for at least temporary relief and the prolongation of the patient's life for a number of years. I differ with Lund only with regard to the priority of this operation. Dr. Wither- spoon of Butte, Mont., at our meeting at St. Louis first presented this operation in this country. I think Dr. Wither- spoon deserves equal credit with Rovsing for this, having worked independently of him. The clinical picture is one every general practitioner as well as the surgeon should know. Many cases show first of all marked symptoms of uremia. In a case of uremia think of the possibility of a congenital cystic kidney as a basis and examine the abdomen. In a comparatively early period you will find a kidney which you can recognize as of the congenital cystic variety; the kidney is lower and easily palpated for that reason. It has a lobulated, soft surface. I made the diagnosis in one case three years ago, first in one kidney and then watched

4. In addition to the references already given, the following will be found of interest:

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the development of the condition in the opposite kidney. The same condition confronted us in that as in one of Dr. Lund's cases, namely, pregnancy. It was necessary to interrupt pregnancy on account of the threatened uremia which would have undoubtedly ensued. The second clinical symptom of this kidney condition is hematuria; a fair proportion of cases of severe bleeding from the kidneys is probably due to such a condition. In every case, congenital cystic kidney appears as a tumor. A large, soft, lobulated tumor of the kidney accompanied with hematuria should be considered among other causes, as due to this condition. It has been supposed to be useless to operate in these cases because they are bilateral, but as Dr. Lund has pointed out, the benefit from such operations is so great that we ought not to abandon them. At a recent meeting of the American Urological Association Dr. Barnett of Fort Wayne reported one case of his own and quoted, among others, four cases of Dr. Ochsner, in which they removed such a kidney, thinking that the condition was unilateral. This condition is always bilateral and if one kidney is ahead of the other in the development of the condition the other will surely catch up with it, and it is perfectly useless to take out one kidney. The condition is due to lack of union of the proximal and distal portions of the urinary tract.

Dr. A. L. CHUTE, Boston: In such experience as I have had the condition has invariably been bilateral. In Walker's new book on this subject he gives some figures concerning the relative frequency of unilateral and bilateral polycystic kidneys. He says that in only one case in thirty is the disease confined to one side. This too small a proportion to allow one to consider nephrectomy in these cases. The last case that I saw illustrates the other point—that of the infection of these kidneys. This patient, a woman of 47, had a history of some renal trouble six years before. This was supposed to be Bright's disease and she improved considerably under treatment. The latter part of last December she had an attack of pain, first in the right side, then in the left. She had a moderately elevated temperature with these attacks. I easily could feel a mass in her left side. I thought this was due to hematogenous infection and that it would quiet down without any interference. The temperature kept up and I operated on this kidney and found two pockets of pus which I thought were abscesses in the cortex, and which I opened. After the operation, the temperature kept up and the patient became apparently uremic and died four days later. Necropsy showed that there were several other infected cysts in the kidney I had operated on, and that the other kidney was also polycystic and contained likewise a number of suppurating cysts. The question has been raised as to the advisability of removing these kidneys when they have become infected.

Dr. ARTHUR DEAN BEVAN, Chicago: I have had six or eight of these cases under observation. The first point I make is that this condition is not always bilateral, or if it is the condition varies so on the two sides that nephrectomy is not entirely eliminated from consideration. I think it is in the majority of cases, but I have had two cases in which we made a nephrectomy for polycystic kidney with practically permanent results. The first case was one in which a severe hemorrhage from the kidney. The hemorrhage was extreme. The man was very anemic. It was before the days of the phenolsulphonaphthalein test and at the time we were using cryoscopy. The cryoscopic examination of the blood, with that as a guide I did not hesitate to remove an enormous polycystic kidney on the right side from which the blood came. The man made an uneventful recovery and a year later I saw him and he was perfectly well. Another case some time later, in a woman, was much the same condition, with recovery, so that, although in the same majority of these cases the condition is bilateral, and a nephrectomy certain number in which it is unilateral, and a nephrectomy is not entirely excluded. In a number of cases in which I have found extensive polycystic conditions in both kidneys

at the time of the exploratory operation, I have been surprised to find, when a purely exploratory operation has been made, that the patients have recovered and have lived for years. The condition slowly progresses and the finding of this polycystic degeneration does not mean anything like an immediate menace to the patient's life. I believe that the work done by Rovsing and Dr. Lund shows a definite and distinct advance. I have not employed this operative procedure, but in the next case of polycystic degeneration of the kidney with which I have to deal I shall certainly employ the Rovsing-Lund procedure. I believe it is perfectly rational and a common-sense proposition and that it does hold out definite benefit to the patient.

Dr. ALBERT J. OCHSNER, Chicago: I wish to bring out two practical points. In this class of cases the patient's condition will be enormously improved by a proper diet. A patient who was a perfectly useless suffering invalid has been able to teach school the entire year with perfect comfort by simply confining herself to the food that one would provide for any patient who has not enough active kidney tissue to do the physiologic work; namely, milk, buttermilk, cooked vegetables, fruits and fruit juices. In the place of meat these patients should eat from two to six eggs each day. By adhering to this diet one will be amazed at the improvement in the condition. Three twenty-minute roentgenizations will produce sterility. Why should the tubes and ovaries be removed in a case in which sterility can be obtained in this safe and simple manner? I have a patient at present under this treatment. This, of course, applies to every female in whom, to prevent uremia, sterility must be secured. In order to make absolutely sure I gave this patient six exposures directly over the ovaries on successive days and feel perfectly certain that pregnancy cannot occur.

Dr. F. W. McRAE, Atlanta, Ga.: I operated in one case of congenital kidney which was certainly unilateral. I came on the kidney accidentally in doing an operation for acute appendicitis on a patient in September, a year ago. The patient was brought in in a rather extreme condition and I found a large cystic tumor. I was not familiar with Dr. Rovsing's work, though I knew of Dr. Lund's. I felt it was safer to make another incision and drain the kidney. The exploration enabled me to examine the opposite kidney and it seemed perfectly normal. The drainage lasted over three months and during that time I had one of our best genito-urinary men make cystoscopic examinations and try to find communication between the kidney and bladder above and below. There seemed to be no connection. In January I removed the kidney. The boy was 14 years old and since that time has increased in weight from about 70 to 110 pounds and is in perfect health. The cyst after draining became infected with a pyocyanus infection, and the boy's condition became bad, so that it was absolutely necessary to remove the kidney, which the father hesitated to have done. This case proved beyond question that some of these patients may be operated on and permanently cured.

Dr. F. B. LUND, Boston: I would not deny the existence of unilateral congenital kidney cyst, but in all necropsies that I have seen they have been bilateral. So large a proportion are bilateral that we should not think of nephrectomy without inspection to ascertain whether the other kidney is normal. Nephrectomy should be done unless there is sufficient kidney function in the diseased kidney to make it worth saving, in which case Rovsing's operation could be done on the diseased kidney, even if the other kidney is healthy. With regard to the use of Roentgen rays for producing sterility, I did not take out the ovaries to produce it; I tied off the tubes and removed one of the ovaries because it was somewhat cystic.

The Source of Dogmatism.—Gross ignorance produces a dogmatic spirit. He who knows nothing thinks that he can teach others what he has himself just been learning.—La Bruyère.

FURTHER STUDIES OF THE THOMPSON-
McFADDEN PELLAGRA COMMISSION

A SUMMARY OF THE SECOND PROGRESS REPORT *

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The First Progress Report of the Thompson-McFadden Pellagra Commission was published in successive numbers of the *American Journal of the Medical Sciences* from April to September in 1913, and a summary of this material appeared in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Jan. 3, 1914. The chief conclusions from the first year's work were stated as follows:

1. The supposition that the ingestion of good or spoiled maize is the essential cause of pellagra is not supported by our study.

2. Pellagra is in all probability a specific infectious disease communicable from person to person by means at present unknown.

3. We have discovered no evidence incriminating flies of the genus *Simulium* in the causation of pellagra, except their universal distribution throughout the area studied. If it is distributed by a blood-sucking insect, *Stomoxys calcitrans* would appear to be the most probable carrier.

4. We are inclined to regard intimate association in the household and the contamination of food with the excretions of pellagrins as possible modes of distribution of the disease.

5. No specific cause of pellagra has been recognized.

It was decided that our efforts during the second year should be devoted especially to a continuation of the field study of pellagra to see whether a further and more intensive investigation of the occurrence and distribution of the disease would yield further evidence confirming our ideas of its infectious nature and additional data indicating the particular manner of its transmission from person to person. The field work of the first year had laid a good foundation for further and more detailed observations in the same territory during the second year. At the same time, however, the attempts to transmit pellagra to animals, the studies of the blood and of the intestinal micro-organisms, and the observations on treatment of pellagra were continued. The detailed accounts of certain portions of this work are to appear in early numbers of the *Archives of Internal Medicine*, and some phases of the work are illustrated in an exhibit displayed at the present session of the American Medical Association.

At the end of 1912 we were able to present records of 282 cases of pellagra in Spartanburg County. In 1913 this number was increased to 847 cases which had occurred in the county and concerning which we have recorded more or less detailed information.

The geographical distribution of pellagra in Spartanburg County has continued to be very uneven, the large active foci of the disease being in and near the large centers of population and especially in the industrial communities surrounding the cotton mills. The agricultural population seemed to be, on the whole, much

less affected by the disease. In 780 of these cases we know the race of the patient and the place in which he lived at the time the disease was recognized; 680 of them were white and 100 negroes, a morbidity rate of 119 per ten thousand among the whites and 38 per ten thousand in the negroes. This ratio of 3:1 is not considered to be necessarily indicative of a relative racial resistance to pellagra in negroes, but rather as the end-result of the influence of several factors. In Spartanburg County about one-fourth of the entire population resides in cotton-mill villages, and it is in these communities, made up almost entirely of white persons, that pellagra is most prevalent. The congestion of population in these communities in conjunction with the poor hygienic conditions under which the people live, as compared with the relative isolation of the bulk of the colored population on farms, appears to us to be an important factor governing racial distribution in Spartanburg County.

The age and sex was ascertained for 740 of the pellagrins, 528 being females and 212 males. The distribution according to sex and age at time of record showed much the same features as were noted in 1912. There was no case under the age of one year and only one, a negro baby, in the second year.¹ In the third year there were 12 cases and between the ages of 2 and 10 years no less than 94 cases, nearly equally divided between boys and girls. Among females, those between 12 and 17 years of age were relatively least frequently affected by pellagra, the age period under 2 years being excepted. In females beyond the age of 17 the pellagra morbidity rose abruptly so that the number of recorded cases in the age period from 20 to 44 equals about 2.5 per cent. of the women now present in the county in that age period, a ratio much higher than was observed in any other group of the population. Women beyond 44 years of age were somewhat less frequently affected by pellagra. In males the number of cases was large from the third to the eighth year, then somewhat less until the lowest morbidity was reached at puberty and maintained from the fourteenth to the twenty-first year, after which there was a gradual increase to old age, the rate after 50 being approximately equal to the rate for females of the same age.

The remarkable features of the data seem to be the almost complete absence of pellagra under the age of 2, its very slight prevalence for the five years following puberty in both sexes, and its slight prevalence in adult males under 50 years of age; further its enormous prevalence in adult females, somewhat less marked prevalence in children of both sexes from 2 to 10 years of age and the almost equally marked prevalence in old age in both sexes. These features of the age and sex distribution we believe to be due in part to differences in individual resistance to pellagra and in part to differences in exposure to the disease, especially by association with other pellagrins.

The data in regard to occupation are available for 726 pellagrins, of whom 413 lived in cotton-mill villages and 313 lived elsewhere. Of those not living in cotton-mill villages (313), more than half, actually 171, were women engaged in housework exclusively; there were 25 children without occupa-

* From the New York Post-Graduate Medical School and Hospital.
* Read before the joint meeting of the Section on Preventive Medicine and the Section on Pharmacology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, June, 1914.

1. We have seen a few definite cases of pellagra in very young children outside of Spartanburg County, one patient from Laurens, S. C., 1½ years old, and one at Clinton, S. C., 13 months of age. We have records of the cases of several other patients less than 2 years old which have been reported to us by reliable observers.

tion; 37 farmers; and the remaining 60 pellagrins represented 19 different occupations, among them 5 merchants, 3 machinists, 1 college student, 1 butcher, 1 postmaster, 1 railroad fireman and 1 printer. Of the 413 pellagrins in mill villages, 133 were women engaged exclusively in housework; 96 were women without occupation; and 110 were women working part or all of the time in the cotton mills. The 71 adult males were practically all mill hands. The remarkable feature of the occupational study seems to be the lack of definite connection between occupation and pellagra. Although the disease was most prevalent in the families of cotton-mill workers, more than half of the cases in these industrial communities were in women and children who never worked in the mills. The suggestion that housework as an occupation favors the development of pellagra is weakened to some extent by the fact that women mill workers were slightly more subject to the disease than the housekeepers in the same mill villages, when due regard is given to the total number of individuals thus engaged. Nevertheless it does seem to us that the high pellagra morbidity in women, children and in old persons of both sexes points to the home as the place where the disease originates in most instances.

The question of the frequency of association between individuals developing pellagra for the first time and persons previously suffering from the disease was suggested by the work of 1912. During 1913 a complete data secured concerning the population of six mill villages have made possible a study of this question. In this population of 5,514 persons there were 115 cases of pellagra incident in 1912 and 1913. In only 19 of these 115 cases did we fail to find antecedent pellagrins living in the same house or next door, and in 7 of these 19 instances the incidence of close association with a preexisting case in more than 80 per cent. of all new cases in these six villages is the most striking feature of this study of association, and it strongly suggests that association is a factor in the spread of pellagra of much greater importance than has previously been thought to be the case. The essential elements in this association have not been fully examined into as yet. Considerable attention is being devoted to ectoparasites, such as lice and bedbugs, as well as to contact and food contamination as possible factors.

An important feature of the work in 1913 has been the house-to-house study of all the population of the mill-working class in six representative mill villages in Spartanburg County, during which the vital statistics of each person and the food habits of each family were recorded. The data recorded in this way cover a population of more than 5,000 people and have made possible approximately accurate statistical studies of the correlation between the occurrence of pellagra and various other ascertained factors. Thus it was found that of the 3,135 persons eating corn meal daily, 98, or 3.1 per cent., were pellagrins, while of the 681 using this food rarely or never, 41, or 6 per cent., were pellagrins. We have analyzed these data in regard to the use of shipped corn meal, local corn meal, any corn meal, fresh meat, canned (tinned) foods, eggs and milk, without discovering any indication that the more frequent use of any one of these foods is associated with an increase in pellagra which

would suggest a causal relationship. Those who used meat daily and those who used milk rarely or never did seem to be somewhat more subject to the disease, but the correlation was far from complete. In fact, we found many cases of pellagra among people abstaining from fresh meat altogether, and several cases in persons taking sweet milk or buttermilk regularly once or even twice a day. Our attempt to discover in this way the essential pellagra-producing food or the essential pellagra-preventing food has not been crowned with success and the evidence suggests, to us at any rate, that neither of them exists in the dietary of the population which we have studied.

In this same population our recorded data have enabled us to ascertain whether or not there was any distinct tendency for new cases of pellagra to develop in close proximity to preexisting cases. For the purposes of this study the population of these villages was divided into three zones. The first zone included all persons living in the same house with a preexisting case of pellagra; the second zone all persons living next door to a preexisting case; and the third zone all persons in the same village living at a greater distance than next door from a preexisting case. The result of this study indicated that of the 819 persons in the first zone, that is, living in the same house with a preexisting case of pellagra, 54, or 6.59 per cent., acquired pellagra during the two years 1912 and 1913; in the second zone 1.72 per cent. acquired the disease and in the third zone only 0.52 per cent.

The correlation shown in this study between the incidence of new cases of pellagra and the proximity of domicile to preexisting cases was more striking than we had been led to expect by the results of our first year's work, and it appears to emphasize the significance of very close relationship between the primary and secondary case, such as is provided by actual residence in the same household or in adjacent houses. From the viewpoint of the possibility of transmission of pellagra by blood-sucking insects, one result of this observation has been to direct attention to those insects most intimately domiciled with man, such as the louse, flea and bedbug, rather than to winged blood-sucking insects with a considerable range of flight.

We are confident that such a remarkable indication of the importance of proximity could not have been disclosed except by the intensive study of the disease in the same locality over a long period of time. Certainly the work of our first year did not reveal it. It seems to us that the conclusion is now clearly warranted that in these mill villages pellagra is in some way transmitted to non-pellagrous persons from a preexisting case and that one of the important factors in this transmission is residence in the immediate neighborhood of a pellagrin.

Another feature of our field work in 1913 has been the survey of communities offering marked contrasts in certain particulars. All the mill villages of Spartanburg County were found to be endemic centers of pellagra. A careful survey of the disposal of human excrement, one in Oconee County and the other in Chester County, S. C., failed to disclose any cases of pellagra which had certainly originated in these villages, although cases which had originated elsewhere were present. In these villages every house was provided

with a water-carriage flush closet connected with a sewer and this seemed to us to be their most important distinguishing characteristic. In the city of Spartanburg, S. C., the active foci of the disease were confined to those sections of the city in which unscreened surface or pail privies were in use. Of the 241 cases in the city of Spartanburg itself, for which data on disposal of sewage were available, it was found that 230 were using unscreened surface or pail privies. In only eleven instances, or 5 per cent. of the total, was a water-carriage system of disposal employed, and several of these cases arose in sections of the city where unscreened surface privies were in use by their neighbors, some of whom were pellagrins. In several other cities we have learned by more superficial surveys that pellagra is far more prevalent in the unsewered sections than elsewhere. In certain hospitals for the insane we have ascertained that pellagra is usually most prevalent and persistent in the wards housing untidy patients.

All these observations have compelled us to regard inefficient methods for disposal of human excrement as an important epidemiologic feature of those communities in which pellagra is endemic and have led us to recommend the installation of water-carriage systems of sewage disposal as a prophylactic measure against this disease.

Our extension studies beyond Spartanburg County have also included a very complete survey of one village, the peculiar topography of which was of great interest. One portion of this village was near a large pond and nearly every family in this section had suffered from tertian or estivo-autumnal malaria. Another portion of the village was on a swiftly running stream, while the remainder was located on a rather steep hillside. Our survey showed that malaria occurred almost exclusively near the pond, but that dysentery, typhoid fever and pellagra had been endemic in all three sections of the village without evident regard to topography.

These studies were also extended to a large island off the coast of South Carolina, the distinguishing characteristic of which was the absence of streams in which *Simulium* could breed. Pellagra was found to be endemic on this island. In May, 1913, one member of the commission and Mr. A. H. Jennings of the U. S. Bureau of Entomology investigated the epidemiology of pellagra in Texas. Our investigations were undertaken in the so-called Panhandle in the northwestern part of Texas where the rainfall is very slight and where running streams are remarkably scarce. In this region we found cases of pellagra originating. *Simulium* was unknown in this section and the nearest possible breeding places for insects of this genus were from 60 to 125 miles away. It was quite impossible that *Simulium* could have been concerned in the etiology of these cases. These and other observations to be published at a later date have further confirmed us in the conclusion based on our investigations of the prevalence, distribution and habits of *Simulium* in Spartanburg County, namely, that in the territory studied, flies of the genus *Simulium* did not fulfill the necessary conditions to serve as an efficient transmitter of pellagra.

The laboratory studies during 1913 included the inoculation of numerous monkeys, *Macacus rhesus*, with filtered and unfiltered suspensions of material from pellagrins, including saliva, duodenal fluid, feces,

tissues from the pharynx, stomach, intestines, brain, spinal cord, blood and lymph from the cutaneous lesions. In addition, monkeys were repeatedly subjected by Mr. A. H. Jennings and Mr. W. V. King to the bites of stable-flies (*Stomoxys calcitrans*) which had been allowed to bite pellagrins, these biting experiments being continued as long as the flies could be kept alive. A considerable proportion of these monkeys died with symptoms of dysentery late in the season and in each case a careful necropsy, including histologic study of the various organs, has been made by Dr. Paul A. Schule. This work has failed to disclose any conclusive evidence that pellagra had been produced in these animals.

The bacteriologic work was directed particularly to the discovery of specific serologic or other allergic reactions on the part of pellagrins toward the various bacterial strains isolated from the intestine. Approximately one thousand bacterial strains have been isolated and studied in this way, but the results of this work have still been inconclusive.

The studies of the cytology of the blood by Dr. O. S. Hillman and Dr. Schule have not disclosed any constant abnormality. A lymphocytosis was observed in approximately 75 per cent. of the cases examined by them.

Heredity as a factor in pellagra has been studied by Dr. C. B. Davenport and Dr. Elizabeth Muncey in collaboration with us. The study of family histories gave some indication of inherited susceptibility to pellagra, but no evidence of inheritance of the disease. Furthermore the apparent transmission of the disease from a woman to her daughter-in-law seemed to be about as common as to her own daughter, provided living conditions and associations were similar, so that even inherited susceptibility cannot be considered as established. This work is being continued this year.

Concerning treatment and prognosis we hope to make a more complete statement at a later time. The fourteen pellagra patients transported to New York by us in 1912 all returned home free from active manifestations of the disease. Two of them died during the following winter of other ailments and eight others have shown recurrent manifestations of the disease, three of them in a severe form. Three cases remained free from recurrence in 1913 and one has not been traced. We are inclined to regard the results of hygienic and dietetic treatment in adults as very comparable to those in tuberculosis, that is to say, the immediate results are often good and the disease appears to be arrested, but on return to former environment and living conditions, recurrence and further progress of the disease is to be expected in the majority of the cases. In children, on the other hand, permanent recovery at home without special treatment is the rule.

SUMMARY

1. The large active foci of pellagra in Spartanburg County were found in and near the large centers of population, and particularly in the cotton-mill villages.
2. Children under the age of 2, adolescents for about five years following puberty and adult males in the active period of life were least frequently affected by pellagra. On the other hand, women from 20 to 44 years of age, old persons of both sexes and children from 2 to 10 years of age were most frequently affected.

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3. No definite connection between occupation and the occurrence of pellagra has been found, although the high pellagra morbidity in the women and children points to the home as the place in which the disease is usually contracted.

4. In the group of incident cases most thoroughly studied, evidence of close association with a preexisting case was disclosed in more than 80 per cent.

5. A house-to-house canvass of the homes of over 5,000 people living in six endemic foci of pellagra failed to disclose any definite relation of the disease to any element of the dietary.

6. In these six villages new cases of pellagra originated almost exclusively in a house in which a pre-existing pellagrin was living, or next door to such a house, suggesting that the disease has spread from old cases as centers.

7. So far as we have observed, pellagra has spread most rapidly in districts where insanitary methods of sewage disposal have been in use.

8. Additional evidence has been obtained to support the conclusion that flies of the genus *Simulium* have nothing to do with pellagra.

9. Animal inoculations and the experimental study of intestinal bacteria have not yielded conclusive results.

10. The studies of the blood have shown a lymphocytosis in most cases, but have not disclosed any constant abnormality characteristic of pellagra.

11. There is no evidence of inheritance of pellagra.

12. The immediate results of hygienic and dietetic treatment in adults have been good, but after returning to former conditions of environment, most of the cases recur. In children, prognosis is very much favorable.

Work was accordingly started in August, 1913, at the laboratory of the United States Public Health Service, Savannah, Ga., and is still in progress at that place.

At the present time we desire simply to make a brief progress report of this work, reserving full details for the report on the completed work.

INOCULATION OF PELLAGROUS TISSUES

1. The brain, spinal cord and their membranes were removed at six necropsies, ground in a meat grinder, mixed with an equal volume of normal saline solution and allowed to extract in the ice-box for periods varying between one hour and eighteen hours. The suspension was then allowed to drip through six thick-nesses of gauze without pressure. The gauze filtrate was either injected into animals without further treatment or injected after filtration through a Berkefeld filter. The gauze filtrate was injected intracerebrally, intravenously and subcutaneously into each of two rhesus monkeys; intraspinally and intraperitoneally into 12; intraspinally and intramuscularly into 2; intracerebrally and intraperitoneally into 2; intracerebrally and intraperitoneally into 2. The Berkefeld filtrate was injected intraspinally into 4.

2. The buccal thoracic and abdominal contents, except intestines, including tongue, salivary glands, tonsils, esophagus, lungs, heart, diaphragm, stomach, liver, spleen, kidneys, omentum and mesentery were removed at one necropsy and all ground in a meat grinder, a portion of which was treated with saline solution and allowed to stand in the ice-box four hours, after which it was squeezed through gauze. A portion of the gauze filtrate was injected intravenously and subcutaneously into each of seven rhesus monkeys. Another portion of the gauze filtrate, after being passed through a Berkefeld filter, was injected intravenously into three.

3. The intestines and fecal contents were removed at seven necropsies, ground in a meat grinder, a portion of which was extracted with saline solution and squeezed through gauze. A portion of the gauze filtrate was injected intravenously and subcutaneously into 7 rhesus monkeys and 1 Java monkey. Another portion, after being passed through a Berkefeld filter, was injected intracerebrally, intravenously and subcutaneously into 1 baboon; intravenously and subcutaneously into each of 10 rhesus monkeys.

4. Skin from five necropsies was ground in a meat grinder, treated with saline solution, squeezed through gauze and a portion of the gauze filtrate injected intracerebrally, intravenously and subcutaneously into 1 rhesus monkey; intravenously and subcutaneously into 1 Java monkey; intravenously and subcutaneously into 3 rhesus monkeys. A Berkefeld filtrate was injected intracerebrally, intravenously and subcutaneously into each of 2 rhesus monkeys.

INOCULATION OF PELLAGROUS FLUIDS AND EXCRETA

1. Blood was drawn from seven pellagrins, and after being either defibrinated or citrated was injected intravenously and intraperitoneally into each of four rhesus monkeys; intravenously into one and intraperitoneally into one.

ATTEMPTS TO TRANSMIT PELLAGRA TO MONKEYS

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Attempts to test the infectivity of pellagra by inoculation in the monkey were made by Anderson and Goldberger¹ in the summer of 1910. Their results were negative. Lavinder² repeated and extended these experiments with similar negative results. Singer, MacNeal and Rooks³ likewise failed to infect rhesus monkeys. A year ago Harris⁴ reported the production of pellagra in the rhesus monkey by the inoculation of a Berkefeld filtrate derived from human

* Read before the joint meeting of the Section on Preventive Medicine and the Section on Pharmacology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, June, 1914.

1. Anderson and Goldberger: An Attempt to Infect the Rhesus Monkey with Blood and Spinal Fluid from Pellagrins, Pub. Health Rep., June 30, 1911, p. 1003.

2. Lavinder: A Note on the Inoculation of the Rhesus Monkey with Blood, Spinal Fluid and Nervous Tissue, etc., Pub. Health Rep., June 30, 1911, p. 1005.

3. Singer, MacNeal and Rooks: Attempts at the Experimental Transmission of Pellagra, Report of the Pellagra Commission of the State of Illinois, 1911.

4. Harris: The Experimental Production of Pellagra in the Monkey, etc., The Journal A. M. A., June 21, 1913, p. 1948.

2. *Pericardial fluid* collected at one necropsy was injected without filtration, intravenously into two rhesus monkeys and after Berkefeld filtration was injected intraspinaly into each of two.

3. *Urine* from four pellagrins, each of which showed a marked indican reaction, was injected intravenously after Berkefeld filtration into five rhesus monkeys, each receiving between 90 and 155 c.c.

4. *Feces* from one pellagrin after Berkefeld filtration was injected intravenously (15 c.c.) into one baboon.

5. *Cerebrospinal fluid* collected at three necropsies was injected, without filtration, intracerebrally and intravenously into 1 rhesus monkey and intraspinaly into 5. Cerebrospinal fluid collected at 2 necropsies was, after Berkefeld filtration, injected intraspinaly into each of 10 rhesus monkeys. Cerebrospinal fluid collected during life from 19 pellagrins and not filtered was injected intraspinaly into 19 rhesus monkeys.

FEEDING OF PELLAGROUS MATERIAL AND SPOILED CORN MEAL

1. *Sputum* from ten pellagrins collected fresh each day was fed by stomach-tube to five rhesus monkeys, each receiving 100 c.c. daily and receiving a total of 3,640 c.c., 1,658 c.c., 2,140 c.c., 1,635 c.c. and 915 c.c., respectively.

2. *Feces* collected fresh each day from two pellagrins with diarrhea was mixed with spoiled corn meal and fed by tube into the empty stomachs of eight rhesus monkeys, each animal receiving 100 c.c. daily, 20 gm. of which was meal. The average amount fed to each animal was 1,270 c.c.

3. *The thoracic and abdominal organs and contents* complete from five necropsies were ground in a meat chopper and fed by stomach-tube to sixteen rhesus monkeys and three baboons.

4. *Brain, cord and membranes, buccal thoracic and abdominal organs and contents complete* from one necropsy were ground in a meat chopper and to the mixture was added spoiled corn meal. The entire mass was fed by tube into the stomachs of eighteen rhesus monkeys and one baboon.

ANIMALS USED

The animals experimented on embraced seventy-seven rhesus monkeys, two Java monkeys and three female baboons.

With few exceptions each animal was inoculated by more than one route, with two or more kinds of material, from more than one case and on more than one occasion.

In all, 103 experiments have been made, in which material collected from pellagrins during life or at necropsy was introduced into the stomachs of animals; fifty-two experiments were made in which pellagrous fluids were injected and ninety-six in which extracts, suspensions or emulsions of pellagrous tissue were injected.

The animals have been exposed daily to the direct rays of the sun by being kept in cages in a glass-covered house.

RESULTS

Eight of our animals died after a longer or shorter time following inoculation. In four instances death was plainly due to some cause other than pellagra; in the other four the cause of death was undetermined.

With one exception, the surviving monkeys have so far shown no indications suggesting pellagra.

The exception referred to is as follows:

M. rhesus 98 was injected intraspinaly with 6 c.c. of spinal fluid, April 14, 1914, and again inoculated May 2 intraspinaly with 4 c.c. of spinal fluid drawn from another pellagrin. The first change in this monkey was noted May 4, 1914, at which time the right forearm appeared slightly swollen and looked as if some of the hair was falling out. The following day the left forearm showed a similar condition. Later both forearms became entirely denuded of hair, the skin became roughened and scaly with large cracks in which appeared a slight serous exudate. Over both wrists the superficial skin seemed to be denuded and the condition gave the appearance of superficial ulceration. On the posterior surface of each hand a similar condition was noticed; the knuckles of the fingers were swollen and reddish and presented cracks and broken skin. May 9 the skin was dry and more scaly. The bowel movements were occasionally loose. Later thick crusts on the skin came away, leaving a pale and slightly scaly surface. The monkey is now again in his usual condition.

The interpretation of these manifestations is not clear. They may, on the one hand, be regarded as non-pellagrous and purely accidental, or, on the other, as indicating pellagra. The former possibility cannot be ruled out. With respect to the latter it is evident that the symptoms may have been brought about by either a living organism or by some unorganized element having a toxic quality. As a definite interpretation is not permissible, no inference as to the communicability of the disease can be made.

THE TREATMENT OF PELLAGRA*

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When I attempt to present to you our present knowledge of the treatment of pellagra, it is that I want to speak of this phase of the problem from the point of view of the pharmacologist and biochemist. Pharmacology, together with pathology, is the foundation of all rational treatment of disease by means of drugs. Biochemistry, on the other hand, is the fundamental science which gives us the basis for a clear understanding of the processes involved in nutrition and metabolism. As the preceding speakers have sufficiently emphasized the fact that the cause of pellagra has been attributed by many authors for nearly a century to the use of a particular kind of food, the discussion of the treatment of the disease from this point of view does not seem uninteresting, and it may possibly contribute to elucidate the still obscure etiology.

All physicians who have had much experience in the treatment of pellagrins agree on one point, namely, that in the milder cases the symptoms will almost always disappear in a relatively short time if the patients are kept in a hospital at rest on a liberal mixed diet, with plenty of fresh meat. The difficulty in carrying out this sort of treatment is that many pellagrins are mentally defective and refuse to comply with the orders of the physician unless forced to understand that this is the only way for an improvement in their

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condition. The attending physician must, therefore, use all available psychotherapeutic methods in order to succeed with the dietary treatment. I cannot enter here into a discussion of the adjustments of the diet in cases associated with vomiting, constipation or diarrhea, which require special dietary measures. It may be said, however, that a mild diarrhea should not be treated with a reduction in the quantity of the diet, as it has been found through metabolic studies that the assimilation of the food is unimpaired in this condition. Constipation is favorably influenced by an increase in the fats of the diet, such as olive oil, butter, cod-liver oil, etc., or by the continued administration of small doses of castor oil. It is interesting to note that patients whose symptoms have disappeared on such treatment will again develop symptoms after having been exposed for several months at their home to the same conditions which prevailed before the onset of the first attack. On the other hand, there are cases on record in which, after dismissal from the hospital, the patients remained well for years. Advanced cases of pellagra, and especially the so-called typhoid pellagra, are often unimproved by any available treatment and end fatally in a shorter or longer period of time.

Let us now turn for a moment to the efficacy of drugs in the treatment of this disease. Lombroso and his school advocated the administration of arsenic in the form of Fowler's solution to pellagrins. Lombroso even went so far as to call arsenic the specific for the disease. His extremely optimistic attitude toward this remedy is not shared by many of his compatriots. In this country arsenic also has its adherents. With the introduction of the cacodylates and salvarsan into therapy, it can be easily understood how these arsenicals were also given a trial in pellagra. Some American authors claim to have had good results from such treatment, while others do not believe in the efficacy of the drug. It cannot be denied that arsenic in any form may be beneficial in many cases of pellagra associated with a loss of body weight and malnutrition, when it seems necessary to make use of this metabolic tonic. Sodium chlorid internally was also advocated by Lombroso, especially for the treatment of pellagra in children. Very little can be said, however, in its favor or in behalf of the dozens of other drugs suggested at different times for the treatment of this disease.

In closing this chapter I should like to call your attention to the fraudulent advertising of proprietary pellagra medicines throughout the Southern states. The manufacturers of these preparations usually claim in a sensational manner that these preparations will positively cure pellagra. Some of these mixtures were analyzed¹ at the Hygienic Laboratory and were found to contain such substances as charcoal, iron salts, small quantities of quinin, etc. It is evident that no cure would be affected by such preparations. "These preparations have usually sold at prices that would be exorbitant for remedies of value in the treatment of the disease. When one considers that most pellagra patients are found among people of small means the advantage taken of the sick and unfortunate by the manufacturers of these nostrums appears in its true light."

Another phase of the treatment concerns the well-known relation between pellagrous erythema and

exposure to sunlight. This fact should be a caution to the patient to keep out of bright sunlight as much as possible. Hydrotherapy may be a useful addition to the treatment. Transfer of the patient to a cooler climate seems to be followed by an improvement in the symptoms, provided that the dietary and general hygienic measures are observed. Attention should be called to the fact that pellagra has developed in persons in the northern climates such as Canada, England and our New England States.

Summing up the previous statements it may be said that, owing to the lack of knowledge regarding the etiology of the disease, the treatment is restricted to symptomatic and empirical procedures in which diet and rest figure most prominently.

In conclusion, I should like to offer a few suggestions in regard to the possible explanation of the beneficial effect of a liberal diet on the course of the disease. From a survey of the clinical and pathologic aspects of pellagra, I have arrived at the conclusion that we are dealing with a chronic intoxication. While the agents at work in this intoxication are as yet unknown, I am inclined to believe that toxic substances exist in certain vegetable foods, not necessarily spoiled, which, if consumed by man over a long period of time, may produce an injurious effect on certain organs of the body. This hypothesis does not rule out the possibility that a dietary deficiency, in the sense to be discussed later, may play a rôle in the production and treatment of pellagra. Extensive feeding experiments which I have carried on during the last year with animals, such as mice, rats and a few monkeys, on an exclusive vegetable diet, have shown that these lower animals develop certain gastro-intestinal symptoms, and sometimes die if put on an exclusive diet of corn, carrots, sweet potatoes, oats, etc. Symptoms arise, often within three or four days, which point to the presence of an intoxication in these animals. Death resulted in some cases in a remarkably short time (three to four days). At necropsy constant lesions were found, such as hyperemia and hemorrhage in the gastro-intestinal canal. Sometimes the kidneys, lungs and other organs show a congestion and slightly hemorrhagic condition. Preliminary experiments showed that extracts of these vegetable products, if fed or injected into animals, produced the same symptoms.

In an investigation by Dr. Myers and myself² for the purpose of ascertaining the nature of the toxic substances involved in this intoxication, the fact was revealed that relatively large amounts of soluble aluminum compounds were present in these vegetable products. It is very difficult to decide at present whether these aluminum salts have any injurious effect on man in the quantities taken up with the food. Toxic effects from the administration of aluminum salts to animals have been observed, and even a few cases of aluminum poisoning in man have been found in the literature. In view of the fact that the animals which were fed on an exclusive diet of corn or certain other vegetables always showed on necropsy gastro-intestinal lesions, it would seem that this diet, to say the least, produced a disturbance in the function of these organs.

It is not always permissible to apply directly the results obtained through animal experimentation to clinical conditions, but these experiments seem to fur-

1. Public Health Reports, 1914.

2. Public Health Reports, 1914.

nish at least the basis for an understanding of the effect of a change in diet on the course of pellagra. By substituting for part of the vegetable food, animal foodstuffs, such as meat, eggs, etc., the absolute amount of vegetable products consumed will be reduced considerably. Hence we probably also reduce the possibility of an injurious action of the vegetable food on the body, particularly the irritant action on the gastro-intestinal canal. Meat is known to be easily digested by pellagrins, leaving practically no unassimilated residue in the intestine. Meat, furthermore, satisfies the appetite in much smaller quantities than does the voluminous vegetable diet with its relatively large amount of undigested cellulose.

Besides the differences in digestibility and food value in the old sense, we have also to consider the specific effect of each constituent of the diet apart from the question of calories, protein, carbohydrates and fats. In the past all of our attention concerning the nutrition of man was devoted mainly to a study of the heat value of food and the proportion of protein, carbohydrate and fat to each other in a given diet. It is only in the last few years that we have realized that there may occur very important differences in the composition of the individual proteins. The work of Fischer, Abderhalden, Mendel and Osborne has shown the great variation in the composition of protein in regard to its content of the various amino-acids. Feeding experiments with the isolated proteins brought to light the fact that, although all proteins are absorbed and assimilated to about the same degree, yet certain proteins lack or are deficient in certain amino-acids essential for growth and maintenance. Most of the proteins derived from animal sources, with the exception of gelatin, seem to be more suitable for human nutrition, as they contain all the necessary components in the right proportion. Some of the vegetable proteins, on the other hand, seem to be deficient in this respect. It can hardly be denied that the majority of the persons who contract pellagra have lived for years on a mainly vegetable diet. In this way a deficiency in nutrition may take place, but it will require considerable further research to establish the fact that food composed of certain vegetable products is insufficient for the demands of the body.

Quite recently another field in nutrition was opened up through the discovery of the presence of small quantities of new substances occurring in foods which seem to be essential for the maintenance of health. These substances are termed vitamins by Funk. They occur in animal as well as vegetable food in varying amounts. Certain foodstuffs, as polished rice, are extremely poor in vitamins; others, as meats, are relatively rich in these substances. The hypothesis has been advanced by Funk that pellagra is a disease due to the lack of some vitamin in food, analogous to the production of beriberi through the more or less exclusive consumption of polished rice. So far no experimental or clinical proofs have been advanced to support this hypothesis.

Summing up these remarks, we see that our modern conceptions of nutrition and metabolism throw some light on the beneficial effect of a liberal mixed diet on the course of pellagra. In conclusion, I should like to say just a few words in regard to the question as to how these same conceptions may help to explain the etiology. It is probably more than a mere coincidence that the population of that part of the world in which

pellagra is endemic lives on a mainly vegetable diet. Economic conditions seem to influence in a general way the diet of people. A vegetable diet is as a rule less expensive, and persons in poor circumstances limit the consumption of the costly meats and other animal food to a minimum. In this connection I should like to call your attention to the fact that pellagra appeared in France soon after the reign of the first Napoleon, a period which was followed by extreme poverty in the country. France recovered from this economic depression in the latter part of the nineteenth century. With this change in economic conditions, partly brought about through the introduction of the more profitable wine industry, pellagra decreased to such an extent that the disease is now very rare in that country. It is impossible to say at present that the food as such is the only factor in the production of pellagra, but even some of the adherents of the infectious theory do not deny that the one-sided diet may be one of the contributing factors in the production of this disease.

The recent advances in the field of nutrition suggest new avenues of approach to the solution of this difficult problem. One will have to consider very seriously:

1. A deficiency or absence of certain vitamins in the diet.
2. The toxic effect of some substances, as aluminum, which occur in certain vegetable food.³
3. A deficiency of the diet in certain amino-acids.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. SILER, GARRISON AND MACNEAL; DRS. LAVINDER, FRANCIS, GRIMM AND LORENZ, AND DR. VOEGTLIN

DR. MARCUS HAASE, Memphis, Tenn.: Some three or four years ago the State Board of Health of Tennessee declared pellagra a transmissible disease, required the physician to report it and the case to be isolated. It can be easily seen how utterly impracticable it would be to carry out any such order, as the cases would have to be under constant official surveillance. The staff of the city hospital in Memphis fought that for about a year and succeeded in having the restriction removed so far as the city of Memphis was concerned. We then began taking in pellagrins constantly; and, with very few exceptions, in the past three years there has not been a month that there has not been one or more pellagrins in the city hospital. During that time, in which we have cared for some 150 or more cases, no case of pellagra has occurred in any inmate of the hospital, or among those constantly employed there, in number over 70. No case has occurred among the patients in the hospital that we could trace to any former case of pellagra. The disease is increasing in our district at an alarming rate. While the death-rate of pellagrins has decreased, the morbidity rate has decidedly increased in the past three years.

DR. R. Q. LILLARD, Nashville, Tenn.: As executive officer of the State Board of Health of Tennessee, I want to correct Dr. Haase on one proposition. The question of the quarantine of pellagrins was brought to the attention of the present State Board of Health, a resolution requiring the quarantining of the disease having been passed by the former

3. The possible relation between aluminum and pellagra was also discussed in a recent monograph by Alessandrini and Scala (*Contributo nuovo alla etiologia e patogenesi della Pellagra*, Roma, 1914), which the author received at the time of proof-reading. These investigators claim that colloidal silica contained in drinking water is one of the most important etiologic factors, in as much as they succeeded in producing lesions resembling pellagra in animals fed on water containing colloidal silica. Colloidal aluminum hydroxid or a mixture of colloidal silica and alumina produced the same results. In view of the fact, silica and alumina produced the same results. In view of the fact, first discovered by us, that aluminum occurs in certain vegetable food in relatively large amounts, the work of the Italian authors furnishes additional evidence that aluminum occupies a prominent position in the etiology of pellagra.

board. I immediately asked the state bacteriologist if he was ready to classify it as a communicable or contagious disease. He said he was not; and the board of health immediately revoked their resolution.

DR. W. C. BROWNSON, Asheville, N. C.: I am fairly familiar with the work of the Thompson-McFadden Pellagra Commission. I know something of how thorough the work has been. While the etiology is still in doubt, it is probable that the disease has some gastro-intestinal cause, and that it may occur from faulty disposition of sewage would seem exceedingly probable. I had no idea that experiments on such an extensive scale had recently been made with monkeys, and after such exhaustive experiments, the fact that most of the monkeys are still living and well, and show no positive signs of the disease would seem to eliminate almost entirely the question of the communicability of the disease from one person to another. It is evident enough that there is no specific for the treatment of pellagra, and the probability is that no medicine does much good. I have had no reason to modify my opinion, expressed long ago, that pellagra should be treated much as we treat tuberculosis, by rest, an abundant nourishing diet, and change of climate when possible. Sodium cacodylate is the most popular medicine at present. Salvarsan has been recommended as a specific, but to me, there is no evidence that it has done good. Sodium cacodylate may do good at times. Two years ago I used it in a number of cases. Most of them seemed to do well. Last year not a single patient with whom I used it seemed to derive any benefit whatever.

DR. W. T. SHELL, Corsicana, Texas: I concur with Dr. Siler that pellagra is a gastro-intestinal trouble. I have used the arsenic preparations, sodium cacodylate and salvarsan in quite a number of cases, but find that better results may be obtained from the gastro-intestinal treatment.

DR. JOHN L. JELKS, Memphis, Tenn.: As the original exponent of the intestinal-infection theory as to the etiology of pellagra, I wish to relate a few things I have observed. Some years ago, I referred to the ameba, which I believed then to be the cause, and in the first part of April, 1910, I presented a pellagrin before the Tennessee State Medical Association, who was suffering from chronic amebiasis. I now have a case, apparently of pellagra, presenting pellagrous skin lesions on elbows and legs. This patient I know has had amebiasis twelve years. I saw him, and made the diagnosis twelve years ago. This man is being nursed by a woman who was brought to me from Mississippi, and was treated by me for pellagra. I performed an appendicocostomy on her, which enabled me to treat the condition rationally, as I view it. That woman is well. She is a little nervous yet, but any one would pronounce her entirely well. The man she is nursing, as in the case of pellagra, exhibits a profound toxemia, and is quite tender along the cervical region. Pellagra represents the results of a profound toxic effect on the blood and nervous system, and the ameba, I believe, is often the cause. I have observed a great increase in the bacillary contents of the intestine, and in one case, reported in my chapter on Dysentery in Hirschman's book, I observed in the *Ameba histolytica*, blunt non-motile bacilli, which were somewhat larger at one end. This was in a case of amebic dysentery of long standing, and a well-defined case of pellagra. The first case reported by me, as stated, was April 12, 1910. A year earlier, however, I reported cases of the skin manifestations of amebiasis. A negress, the body-servant of the nurse referred to, has pellagra. The nurse did not contract the disease direct from the servant, but it is probable that both contracted the disease from polluted water or infected vegetables. In our part of the country, the vegetable gardens are being infected, and infected vegetables are going to prove a greater menace to the health of our people than we realize at present. I cannot ascribe an etiologic significance either to corn or to the *Simulium reptaens*. I am rather inclined to the bacillary toxic origin, though the ameba may be the host. Salvarsan never cured a patient. The results obtained by its use were from the salt solution, which washed the toxic blood and diluted

the toxins. The same results would have been obtained from salt solutions. The treatment must be begun in the early stages, before irreparable damage has been done to the central nervous system, for, thereafter, there is no cure.

DR. ROBERT WILSON, JR., Charleston, S. C.: In Charleston we gave up, some time ago, the theory advanced by Dr. Sambon that the possible carrier is a *Simulium*, for while cases of pellagra are fairly numerous the simulum is not found. Several pellagrins have come under my observation who were born in Charleston, and have never been out of the city. On Johns Island, a sea island near the city, which, if I am not mistaken, is the one alluded to by Dr. Siler, pellagra has existed for a number of years. This island is one of the low sandy islands of the coastal region, and there are no running streams on it, and no *Simulidac*. It is my impression, although I am not able to give statistics off hand, that with us pellagra is much more common in the negro than it seems to be in the upper part of the state where the Thompson-McFadden Commission have been working. I was much interested in hearing Dr. Siler's conclusion with regard to the possible influence of soil pollution on the prevalence of pellagra. In Charleston it is only recently that we have introduced a water-carriage system of sewage disposal, old-fashioned surface privies having been in use for a great many years, with consequent soil pollution. This may possibly explain the relatively large amount of pellagra which occurs in Charleston. It will be exceedingly interesting to note if the introduction of the new sewage disposal system and the destruction of the surface privies will be followed by a diminution in the prevalence of pellagra.

DR. WARD J. MACNEAL, New York: In 1910 the Illinois Pellagra Commission undertook to transmit pellagra to monkeys, using *Macacus rhesus*. Something over 100 monkeys were used. Many of the animals were injected with blood; some with cerebrospinal fluid; others with tissues taken at necropsy. Some rather curious and interesting skin lesions developed in a few of these animals, but nothing which we could recognize as typical of pellagra. Many of the monkeys lived two years after inoculation. The Thompson-McFadden Pellagra Commission has now used about 125 monkeys in the work which was reported here. Some of these animals have lived considerably more than two years after being inoculated and, so far, we have been unable to see in any of them, anything which we could regard as a reliable sign of pellagra. The skin lesions which most closely resembled those seen in human pellagra occurred in one of the animals that we saved as a control. It seems to me very important that a considerable number of animals should be kept as controls in all such experiments. It is exceedingly difficult to make a diagnosis of pellagra in a monkey satisfactory to everybody. I would like to ask Dr. Francis about the time interval between inoculation and the appearance of the lesions. It seems rather important also to know how long after the material was collected it was introduced into the monkeys. This is particularly important in the one instance in which the suggestive skin lesions were obtained. The details with regard to that one animal would be of interest. Something may be said concerning the prognosis in pellagra. One might get the idea from Dr. Voegtlin's paper that typhoid pellagra is invariably fatal. One case of this type occurred in the Illinois State Hospital at Kankakee. The patient was in a typhoid state for a period of three or four days, yet she recovered from the attack and has remained free from recurrence for four years. In another patient, observed in 1912, occurred one of the severest attacks of pellagra that I ever saw. The patient was in a typhoid state for a week, yet she recovered from that attack and has since had no recurrence. There is some indication, therefore, that these severe attacks of pellagra are not necessarily fatal. Accurate prognosis is exceedingly difficult in any of these cases. Dr. Voegtlin stated that pellagra could not be found except in people who had lived for many years on a vegetable diet. I don't know on what observations that statement has been based; but it seems to me there is good indication that pellagra can be recognized in some

persons, particularly in children 2 or 3 years old, who have not lived very long on a vegetable diet; who have, in fact, lived on a diet consisting largely of milk. It seems to me that that statement ought not to pass unchallenged.

DR. CLAUDE SMITH, Atlanta, Ga.: If this case had been referred to Dr. Siler, what would the commission's reply have been, and in the light of their present knowledge, what would they advise with regard to the handling of pellagra cases? In addition to the question which Dr. MacNeal has asked as to the time of inoculation, will Dr. Francis state the type of inoculations made on this monkey, and the length of time which had elapsed when the lesions appeared?

DR. J. F. SILER, New York: Dr. Smith has asked a difficult question; one which it is not possible to answer definitely. It is our opinion that pellagra is an infectious disease. Our epidemiologic and laboratory studies have not, so far, given us any definite clue as to the probable nature of the hypothetical virus. We advise in these cases improvements in sanitary conditions. The things which we consider most important are personal cleanliness, thorough screening of dwelling-houses and improvements in methods of disposal of excreta. We stress the importance of having fly-proof privies and screened dwellings, not only as a possible protection against pellagra but also as preventive measures for such common diseases as typhoid, dysentery, hookworm, summer diarrheas, malaria, etc. Dr. Haase spoke of the fact that pellagra never spreads in hospitals. This is interesting and difficult to explain. I studied pellagra at the Peoria State Hospital when the disease existed there in epidemic form. There were about 175 cases or 8 per cent. of the inmates. None of the nurses or doctors contracted the disease. This institution had, during the same period of time, about 75 inmates showing active symptoms of tuberculosis and also an epidemic of amebic dysentery. None of the nurses or doctors, so far as I could learn, showed any evidence of having contracted tuberculosis from these patients, nor did any of them have dysentery. It will, I think, be admitted that the character and degree of association between nurse and pellagra patients in hospitals and the environmental conditions surrounding this association, are quite different from those existing in the homes of the element of the population in which pellagra is found most frequently. As a matter of fact, I know that a number of physicians in the Southern States have had pellagra and I have had reports of pellagra in five nurses. These are merely unconfirmed reports, however, which we hope to investigate fully. In our investigations in the South, the entomologists from the Bureau of Entomology who are collaborating with us have found the bedbugs are practically universal in the element of the population most frequently affected by pellagra. This applies particularly to mill communities where pellagra is most prevalent. One striking feature of the epidemiology of pellagra is that males between 20 and 45 years of age seldom contract it. In this age period there are about nine females to every male pellagrin. It cannot be said that adult males are relatively immune to the bites of bedbugs.

DR. JOHN RITTER, Chicago: Is it considered a fact that the bedbug is a carrier of pellagra infection?

DR. EDWARD FRANCIS, Washington, D. C.: Dr. MacNeal has asked for some specific data with regard to Rhesus 98, the monkey which showed the skin eruption. This monkey was injected intraspinally with 6 c.c. of spinal fluid, April 14, 1914, and was again inoculated May 2, intraspinally, with 4 c.c. of spinal fluid drawn from another patient. Both pellagrins were insane.

DR. CARL VOEGTLIN, Washington, D. C.: The Thompson-McFadden Pellagra Commission asserts that pellagra is an infectious disease. The proofs advanced so far are only indirect and, therefore, not conclusive. The methods used by the Commission for the study of the relation of food to pellagra are defective inasmuch as they do not take into full consideration the quantity and quality of each food in the diet. It is a great mistake to make such superficial dietary studies, which often lead to false conclusions, a fact well illustrated in the history of the etiology of beriberi. Not every person

who consumes polished rice contracts beriberi, because the production of this disease depends on the quantity of polished rice consumed as well as the quantity and quality of the other foods contained in a particular diet. It would be absolutely wrong to say that, because many people eat polished rice daily together with other food without getting beriberi, rice did not have anything to do with beriberi. This fact was well brought out in the feeding experiments in the Japanese navy. As soon as part of the polished rice was replaced by certain other food, beriberi began to disappear. Yet the Japanese sailors still had rice in their daily ration. The dietary studies carried out by the experiment stations of the Department of Agriculture in various sections of the Southern States are of much value, as they determine the amount of each food consumed by the various families. These studies plainly show that the vegetable foods preponderate greatly over the animal food in the diet commonly used in the South. Sometimes the diet consists entirely, as you may know, of corn and fat pork.

I admit that the question of the appearance of pellagra in young children in its relation to food is a difficult problem to solve. I think, however, that there exists a possibility of explaining it on the assumption that toxic substances are consumed by the mother which are excreted with the milk and cause an intoxication of the infant. Another possibility is the absence of certain substances—vitamins—in the milk. It is well known that nursing mothers who have beriberi will often give the disease to their infants. As soon as the infants receive normal milk the symptoms will disappear. There exists, therefore, an intimate relation between the composition of the milk of the mother and the health of the infant. If the infant is fed on cow's milk we may deal with a similar proposition. Cows eat exclusively vegetable food, and it is quite possible that certain toxic substances consumed will go over into the milk. We found, for instance, that cow's milk contains considerable quantities of aluminum. Of course I admit that this is all indirect evidence and does not prove definitely that pellagra is a disease due to a dietary deficiency or to the presence of toxic substances in the diet. On the other hand, I can say that just as much weight of argument is on the side of the nutrition theory as on the side of the infection theory.

IMMUNITY IN TUBERCULOSIS

FURTHER EXPERIMENTS*

GERALD B. WEBB, M.D.

AND

GEORGE BURTON GILBERT, M.D.

COLORADO SPRINGS, COLO.

In 1911, experiments were reported¹ on twelve monkeys. The subsequent history of those not killed at that time follows:

MONKEY 1.—Control. Jan. 19, 1912. The monkey had not become spontaneously infected since its purchase, June 8, 1910.

Oct. 14, 1912: Intradermal tuberculin test 0.1 mg. O. T. Result negative.

Dec. 1, 1912: Animal has refused to eat for three days. Found dead. Necropsy, no trace of tuberculosis anywhere.

MONKEY 2.—Received 25 virulent human tubercle bacilli by subcutaneous injection. June 9, 1910, thirty-five bacilli of this culture had infected a guinea-pig (Barber culture). June 7, 1911, killed. No evidence of tubercle anywhere. Lymph-nodes from various parts ground up and injected into guinea-pig without producing infection.

* This work was assisted by a grant from the Committee on Scientific Research of the American Medical Association.

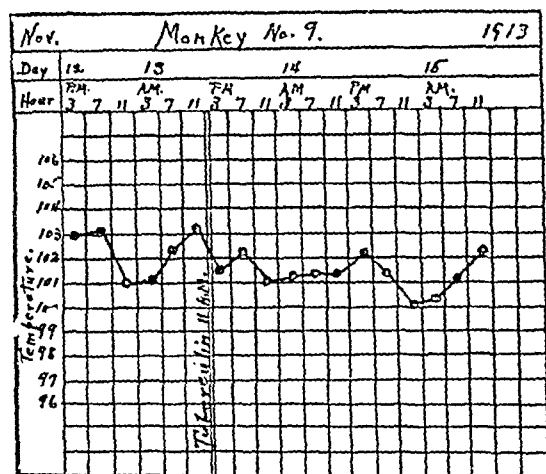
* Read before the Section on Pathology and Physiology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Webb, G. B., and Williams, W. W.: Immunity in Tuberculosis, *THE JOURNAL A. M. A.*, Oct. 28, 1911, p. 1431.

MONKEY 3.—Received 100 virulent human tubercle bacilli by subcutaneous injection, of same culture, June 8, 1910.

Sept. 6, 1911: Conditions resembling elephantiasis had developed. Animal killed. Lower half of vulva, buttocks, tail, legs, showed dense infiltration of skin about $\frac{1}{2}$ inch in thickness. The swollen parts were soft but firm. Edematous, not reddened. All organs normal. No signs of tuberculosis anywhere. Pieces of swollen area, lymph-nodes from various parts ground up and injected into guinea-pig without infection resulting.

MONKEY 4.—Received 200 human tubercle bacilli of same culture by subcutaneous injection, June 8, 1910.



lesions in liver. Scattered tubercles in lungs. This monkey was evidently infected on arrival or shortly after. The positive intradermal reaction was the first we had experienced in any monkey and the decisiveness convinced us that those reported in our former papers were probably not positive.

Through the courtesy of Dr. Lawrason Brown of Saranac, a culture (Brown C₁) was received from which Dr. Brown had been able to infect a guinea-pig with 20 bacilli. We wished to ascertain how many bacilli of this culture would, inoculated subcutaneously, infect a monkey.

Preliminary experiments were made on guinea-pigs with results mentioned below.

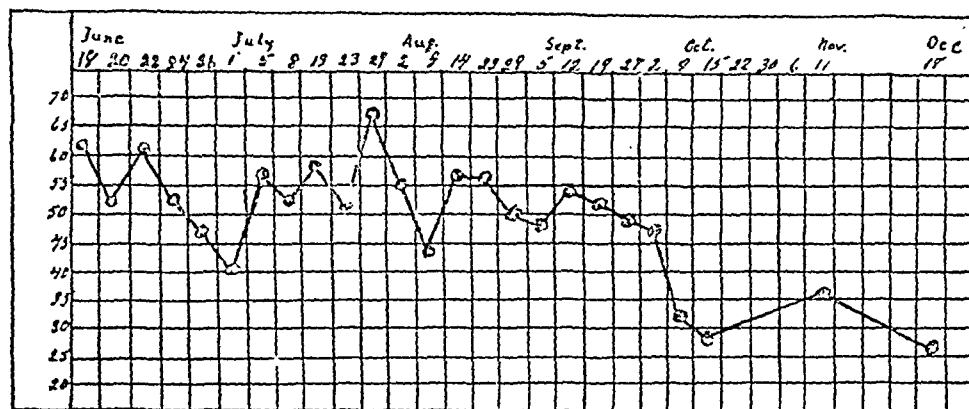


Chart 3.—Percentage of mononuclears, Monkey 14.

GUINEA-PIG 2.—Twenty-five bacilli inoculated into right nipple area.

GUINEA-PIG 3.—Nov. 11, 1912: Several thousand bacilli inoculated into right nipple area.

GUINEA-PIG 4.—Twenty-five bacilli inoculated into right nipple area.

GUINEA-PIG 5.—Fifty bacilli inoculated into right nipple area.

GUINEA-PIG 6.—Fifty bacilli inoculated into right nipple area.

GUINEA-PIG 7.—One hundred bacilli inoculated into right nipple area.

GUINEA-PIG 8.—Ten bacilli inoculated into right nipple area. All pigs became definitely infected and tuberculosis was confirmed by necropsies.

This culture, from which only ten bacilli could cause infection, was evidently more virulent than any we had before employed.

Inoculations were made into guinea-pigs in increasing doses as the records indicate (Tables 1 and 2), but each pig finally developed tuberculosis.

TABLE 1.—INOCULATIONS INTO GUINEA-PIG 6

Date	Tubercle Bacilli	Date	Tubercle Bacilli
1/ 9/13	2	2/ 3/13	14
1/13/13	4	2/ 6/13	16
1/16/13	6	2/10/13	20
1/20/13	8	2/13/13	25
1/23/13	9	2/17/13	30
1/27/13	10	2/20/13	35
1/30/13	12	2/24/13	40

Feb. 27, 1913: Pig has local lump at inner side of left nipple.

TABLE 2.—INOCULATIONS INTO GUINEA-PIGS 30, 31 AND 32

Date	Tubercle Bacilli	Date	Tubercle Bacilli
5/19/13	R 2	6/23/13	L 12
5/26/13	R 4	6/30/13	L 14
6/ 2/13	L 6	7/ 7/13	R 16
6/ 9/13	L 8	7/10/13	R 20
6/16/13	L 10	7/21/13	R 20

Injections were made into right and left nipple areas according to designation R or L.

July 21, 1913: Probable infection of groin glands on left side.

Sept. 3, 1913: Definite infection of groin glands on left side.

MONKEY 15.—Jan. 20, 1913: Three hundred bacilli, Culture Brown C₁, inoculated just below left nipple.

March 4, 1913: Large local lesion at site of inoculation. Enlarged gland in left axilla. Intradermal tuberculin test ++ (positive).

March 6, 1913: Killed. Local lesion and infected axillary gland. Otherwise no evidence of tuberculosis.

MONKEY 16.—July 1, 1912: Broken leg; discarded. Necropsy negative.

MONKEY 17.—Oct. 31, 1912: Prolapsed bowel, discarded. Necropsy: lobar pneumonia.

MONKEY 18.—Jan. 20, 1913: Four hundred bacilli, Culture Brown C₁, inoculated just below left nipple.

March 4, 1913: Large local lesion. Enlarged hard gland in left axilla. Intradermal tuberculin test ++ (positive).

March 24, 1913: Sent to Dr. John F. Anderson, Public Health Service, Washington, D. C. This monkey was ideally infected for an attempt at cure by the Friedmann remedy, but died after a few months.

MONKEY 19.—March 31, 1913: Sixty bacilli, Culture Brown C₁, injected near right nipple.

June 26, 1913: No local lesion or enlarged glands.

Nov. 12, 1913: Subcutaneous tuberculin test (Chart 5) negative.

June 3, 1914: Killed. Necropsy completely negative.

MONKEY 20.—March 31, 1913: Twenty-five bacilli, Culture Brown C₁, inoculated near right nipple.

May 7, 1913: No local lesion.

May 29, 1913: No local lesion or glands enlarged.

Nov. 13, 1913: Tuberculin reaction (subcutaneous test). Notice (see Chart 6) interference with night drop. Probably positive.

Dec. 10, 1913: Found dead. Necropsy negative except for a pus-sack in lesser peritoneal cavity. No tubercle bacilli could be found on staining this pus. No enlarged bronchial glands.

MONKEY 21.—Nov. 12, 1913: Subcutaneous tuberculin test (Chart 7) negative.

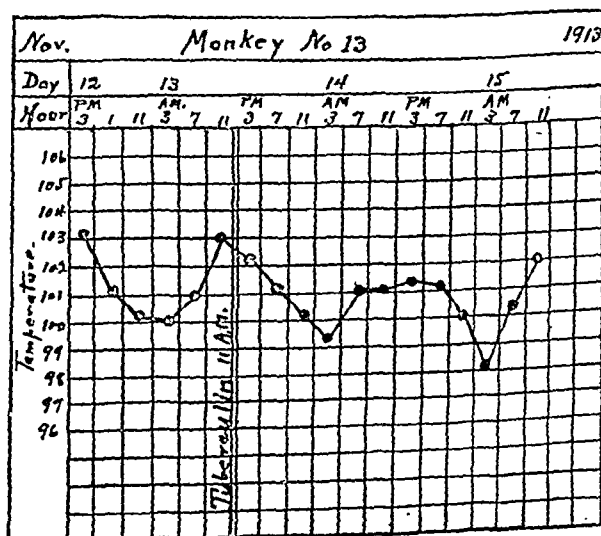


Chart 4.—Temperature chart of Monkey 13.

Jan. 8, 1914: A burn made above left ankle which produced a linear scar.

Feb. 26, 1914: Three hundred bacilli (Culture Brown C₁) injected into scar. The site of inoculation bled and the blood was reinjected into two other places in scar.

MONKEY 23.—Nov. 12, 1913: Subcutaneous tuberculin test (Chart 9) negative.

Feb. 26, 1914: Three hundred bacilli (Culture Brown C₁) injected into left leg.

Blood Examinations:

MONKEY 21.—Feb. 27, 1914: Platelets 468,000. Whites 12,600. Lymphocytes 64.5 per cent.

MONKEY 23.—Feb. 27, 1914: Platelets 400,000. Whites 11,000. Lymphocytes 54.5 per cent.

MONKEY 21.—March 10, 1914: Platelets 532,000. Whites 16,600. Lymphocytes 64.5 per cent.

MONKEY 23.—March 10, 1914: Platelets 416,000. Whites 17,060. Lymphocytes 57 per cent.

MONKEY 21.—March 12, 1914: Platelets 516,000.

MONKEY 23.—March 12, 1914: Platelets 384,000.

MONKEY 21.—March 25, 1914: Platelets 542,000. Lymphocytes 72 per cent.

MONKEY 23.—March 23, 1914: Platelets 504,000. Lymphocytes 60 per cent.

MONKEY 23.—April 1, 1914: Has a local lump. No enlarged glands.

April 2, 1914: This lump removed under ether.

April 3, 1914: Good healing. No glands in either monkey.

MONKEY 21.—Platelets 596,000.

MONKEY 23.—Platelets 440,000.

April 28, 1914: Both monkeys killed. Necropsy:

MONKEY 21.—Several tuberculous nodules in liver, also liver abscess. Tuberculous glands in peritoneum. The scar had become ulcerated and had bled easily. No inguinal glands were infected.

MONKEY 23.—Necropsy completely negative.

MONKEY 22.—March 31, 1913: Ten bacilli (Culture Brown C.) injected just below right nipple.

May 7, 1913: No local lesion.

July 29, 1913: No local lesion or enlarged gland.

Nov. 12, 1913: Subcutaneous tuberculin test (Chart 8) negative.

Aug. 3, 1914: Killed. Necropsy negative.

MONKEY 24.—March 31, 1913: One hundred bacilli (Culture Brown C.) injected near right nipple.

May 28, 1913: Local lesion, hard lump. Enlarged gland in right axilla.

May 29, 1913: Under ether local lesion and enlarged gland and axillary gland completely removed.

June 26, 1913: Complete healing, no evidence of enlarged glands or return of lesion.

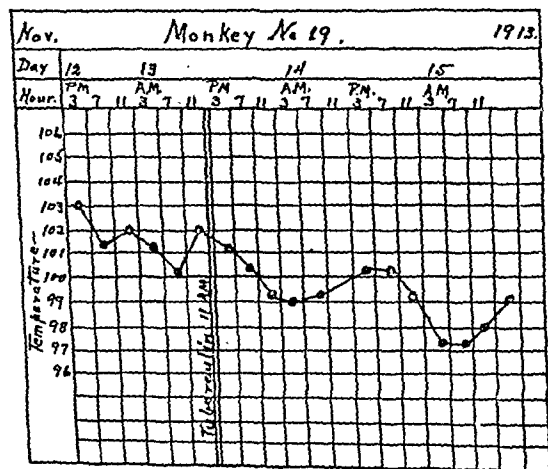


Chart 5.—Temperature chart of Monkey 19.

Sept. 10, 1913: Killed. Portions of left eye and left side of neck swollen. Extensive tuberculosis of lungs, spleen and bronchial glands. Glands over sternum and in neck all purulent. Few tubercles in liver. No local glands in right axilla.

GUINEA-PIG 55.—Dec. 29, 1913: Given 200 bacilli (Lil culture) at nipple area.

Jan. 18, 1914: Local lesion and enlarged inguinal gland.

Jan. 20, 1914: Nipple, local lesion and inguinal glands removed and entire groin cleaned out down to muscles under ether.

March 5, 1914: Groin entirely healed.

April 11, 1914: Killed. Extensive tuberculosis of liver, spleen and lungs.

The following attempt to treat tuberculous guinea-pigs with inoculations of living tubercle bacilli is of interest:

Dec. 19, 1912: Guinea-Pigs 13, 15, 16 and 17, weighing about 500 gm., were each given 25 bacilli of Culture Brown C₁ in right nipple area.

Jan. 13, 1913: Each pig has slightly enlarged and hard right inguinal gland. Pigs 16 and 17 were used as controls. Pigs 13 and 15 were given inoculations of live tubercle bacilli from the same culture as that producing the infection. These

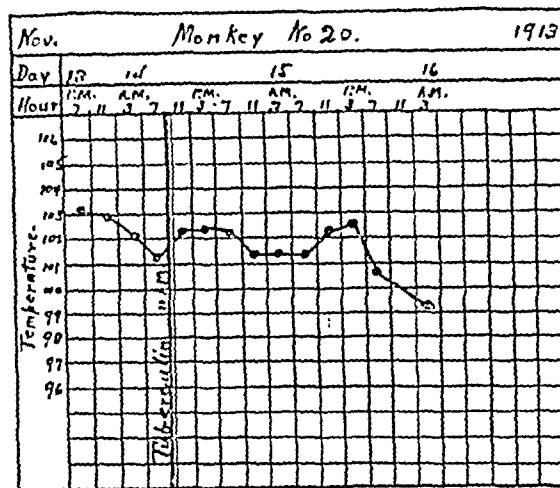


Chart 6.—Temperature chart of Monkey 20.

inoculations were given in the left nipple area, the numbers given being slowly increased from 1 to 60 during a period of twelve weeks.²

Table 3 gives the numbers given and the dates.

Date	Tubercle Guinea-Pig 15	Bacilli Guinea-Pig 13	Date	Tubercle Guinea-Pig 15	Bacilli Guinea-Pig 13
1/9/13	2	1	2/10/13	20	14
1/13/13	4	3	2/13/13	25	16
1/16/13	6	3	2/17/13	30	20
1/20/13	8	5	2/20/13	35	25
1/23/13	9	6	2/24/13	40	30
1/27/13	10	7	3/3/13	45	35
1/30/13	12	8	3/10/13	50	40
2/3/13	14	10	3/27/13	50	40
2/6/13	16	12	4/3/13	60	50

April 21, 1913: Guinea-Pig 13 had discharging sinus in right nipple area. Killed. Large inguinal glands on right side. Large local lesion. Few tubercles in spleen. Otherwise negative.

May 8, 1913: Guinea-Pigs 15 and 16 were killed. Each had dry ulcer and large local lesion. Right inguinal glands were of equal size. Guinea-pig 16 showed no other tuberculous lesions. Guinea-Pig 15 had a few tubercles in spleen and very minute enlarged bronchial glands.

Nov. 22, 1913: Guinea-Pig 17 killed. Local lesion and right inguinal glands same as others. No other tuberculous lesions. This experiment certainly failed to show any favorable action due to the treatment given. Two pigs in the same series, Guinea-Pigs 14 and 18, treated with tuberculin showed much more extensive and widespread tuberculosis.

It has probably been taken for granted that virulent cultures are all of equal potency. By means of the Barber technic of isolating definite small numbers it may be shown that this is not the case.

2. These experiments also prove that a tuberculous guinea-pig is immune to subsequent small lethal doses inoculated subcutaneously. "Römer, and following him Tomarkin, were able to show a sustained resistance of moderately tuberculous guinea-pigs toward a fresh cutaneous inoculation. A similar immunity toward a subcutaneous dose, so far as I know, has not yet been demonstrated."—Smith, Theobald: An Attempt to Interpret Present-Day Uses of Vaccines, THE JOURNAL A. M. A., May 24, 1913, p. 1591.

Table 4 gives a list of certain cultures and the smallest number so far found capable of producing progressive and fatal tuberculosis in adult guinea-pigs.

TABLE 4.—POTENCY OF FATAL CULTURES

Cultures	Minimum Lethal Number
1. B	120 bacilli
2. Barber	35 bacilli
3. Brown C ₁	10 bacilli
4. Lil	35 bacilli
5. Bd	10 bacilli
6. Ht	50 bacilli
7. Rgis	10 bacilli

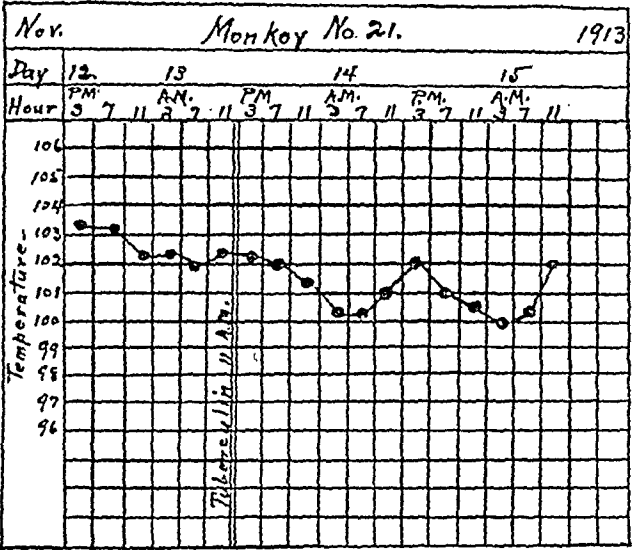


Chart 7.—Temperature chart of Monkey 21.

Culture 1 has already been described.³ Three years later this culture from which 120 bacilli had infected a pig, had so decreased in virulence that 100,000 failed repeatedly to infect a guinea-pig.

Culture 2 has also been described.⁴

Culture 3 was isolated in Saranac Lake from the sputum of an advanced consumptive.

Cultures 4, 5, 6 and 7 were grown from the sputum of advanced active cases of pulmonary tuberculosis by means of the antiformin method grown on Dorset's egg-medium and tested within a few months after first obtained.

The following experiment was undertaken to compare the infection produced by the same dosage in two very young guinea-pigs, A and B, a pregnant female pig, C, a nursing female pig, D, and a normal male pig, E, weighing, respectively, 163, 128, 709, 591, and 573 gm.:

- Jan. 13, 1914: Each pig received 60 bacilli, Culture "Lil."
- March 29, 1914: A died of extensive tuberculosis.
- April 12, 1914: B died of extensive tuberculosis. C, D and E in good health.
- June 8, 1914: C, D and E killed. Necropsies showed: C, very extensive tuberculosis; D, no evidence of tuberculosis; E, moderate amount of tuberculosis.

It is of course possible that D failed to receive the bacilli at the time of inoculation. The disease made more rapid progress in the pregnant female than in the normal male and was of a galloping type in the tiny pigs.

Very young guinea-pigs would seem to be much more susceptible to infection by a definite number of bacilli than the older pigs used.

The following experiments on calves are of interest as they indicate the small number of virulent bovine bacilli which may cause infection, and also that a calf can apparently overcome a mild infection.

Table 5 shows the approximate number of virulent bovine bacilli given to the different calves on the various dates.

TABLE 5.—INOCULATIONS INTO CALVES

Calf No.	Age, Weeks	9/20/11	10/4/11	11/15/11	12/1/11	12/11/11	1/20/12	2/13/12
1.	3	50	...	...	5,000	100,000	1,000,000	50 million
2.	13	50	250	500	5,000	...	500,000	5 million
3.	3	50	250	500	5,000	100,000	1,000,000	50 million
4.	3	...	...	...	500	100,000	1,000,000	50 million
5.	3	...	...	...	500	5,000	500,000	5 million
6.	3	...	...	...	500	5,000	500,000	5 million
7.	3	...	...	...	...	...	...	1,000
8.	3	...	...	...	...	...	...	1,000

March 13, 1912: The intradermal test of Romer was applied to calves 1-6; 50 mg. O. T. was used for each calf. Calves 1, 2, 4, 5 and 6 were positive.

March 21, 1912: The same test was repeated, and all calves, including Calves 7 and 8, were positive.

April 10, 1912: Given subcutaneous tuberculin test and all temperatures taken for thirty-six hours. Calves 1, 7 and 8 were considered suspicious.

April 12, 1912: Calves 5 and 6 killed. Necropsy: One left internal iliac gland in each contained hard calcified healed tubercles. All other glands normal. Otherwise negative.

Oct. 1, 1912: Subcutaneous tuberculin test repeated. Calf 1, typical reaction. Calf 3, not typical reaction but is sick clinically.

Oct. 8, 1912: Calves 1 and 3 killed. Necropsy: Calf 1, fat and in fine condition. No tuberculosis found anywhere. Calf 3, thin and small. One large gland filled with pus on outer side of each thigh at site of inoculations. Pus contained tubercle bacilli. Other glands and rest of body entirely negative.

June 15, 1914: Calves 2, 4, 7 and 8 have been since tested, once with the subcutaneous, and three times with the intradermal method, during the last two years and all tests have been negative.

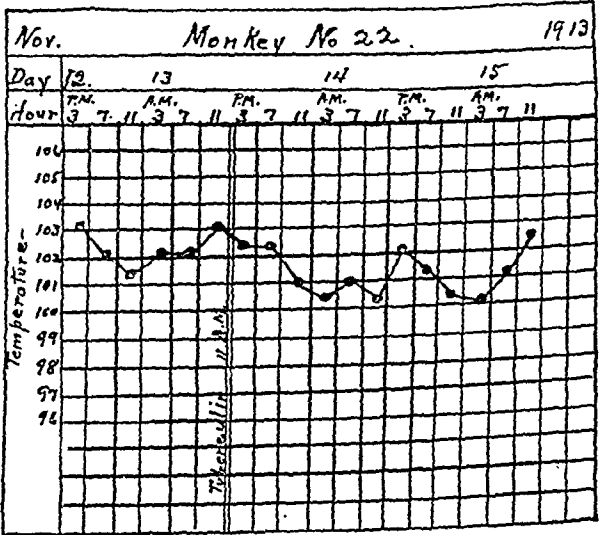


Chart 8.—Temperature chart of Monkey 22.

Inasmuch as 1,000 bacilli of this culture were able to produce infection in calves 3 weeks old, the amounts given were entirely too large and the increase in dosage far too rapid. Only one calf, Calf 3, had clinical tuberculosis, calcified tubercles were found in two, and still another gave no microscopic evidences of tuberculosis.

The fact that calves 7 and 8 apparently overcame completely the mild infection produced is of interest.

3. Webb and Williams: Immunity Production by Inoculation of Increasing Numbers of Bacteria Beginning with One Living Organism, Tr. Sixth International Congress on Tuberculosis, 1908.
4. Webb, G. B., and Williams, W. W.: Immunity in Tuberculosis: Its Production in Monkeys and Children, THE JOURNAL A. M. A., Oct. 28, 1911, p. 1431.

The Barber technic has been of great service in studying the effect of subcutaneous inoculation of minute doses of tubercle bacilli. In the infection of human beings by Nature it has been thought that the bacilli can pass through mucous membranes without the production of a local lesion. In the usual laboratory studies a local lesion following subcutaneous inoculation has been regarded as a *sine qua non*, and an infection of neighboring glands has been predicated.

In a series of guinea-pigs inoculated with minute (from 10 to 60 tubercle bacilli) infective doses sub-

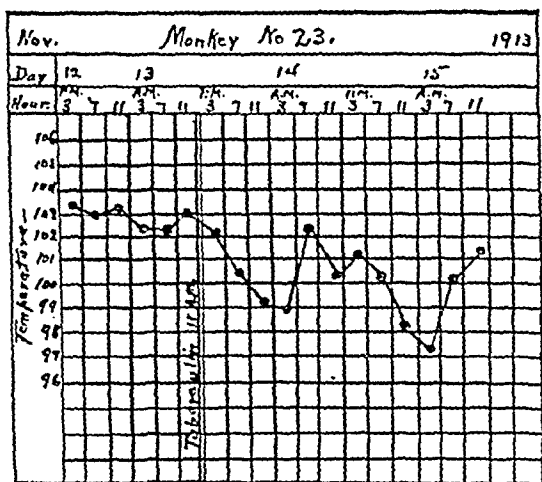


Chart 9.—Temperature chart of Monkey 23.

cutaneously, we have frequently observed the absence of a local lesion, but practically never have failed to find the local glands infected as the following specify:

1. Glands infected but no local lesion, fifty-five guinea-pigs.
2. Glands infected and local lesions, twenty-five guinea-pigs.
3. No glands infected or local lesion, but splenic infection, two guinea-pigs. (These, however, had platelets added to the bacilli.)
4. Failed to become infected, five guinea-pigs.

Our experience with both the intradermal and subcutaneous tuberculin diagnostic tests in monkeys has been rather uncertain and decidedly unsatisfactory. Monkey 6 gave repeated negative results to varying amounts of O. T. given intradermally, and then died with extensive, scattered tuberculosis.

Monkeys 8, 10 and 11 gave positive reactions to 20 mg. O. T. given intradermally, but complete necropsies failed to show any tuberculosis. No rise of temperature after the subcutaneous inoculation of tuberculin has been observed. Interference with the normal night drop has occurred rather frequently, as in Monkeys 9 and 12 when the necropsies were completely negative and in Monkey 20, when a small amount of tuberculosis was found at necropsy. Certainly repeated tests would seem necessary to decide whether or not a monkey had been infected.

In our report⁴ on immunity in tuberculosis in 1911, mention was made of two children inoculated with Culture B.

The children to-day (June 11, 1914), are negative to the von Pirquet reaction, using 100 per cent. O. T. Five other children were later reported on, but Culture B, which was employed, was found to have become avirulent, 200,000 bacilli of this culture failing to infect guinea-pigs.

One of these children (L), however, was so badly exposed, living in a three-room house with an inebriate consumptive in the last stages, that an effort was made to immunize if possible with a more virulent culture. At that time the graded inoculation of this culture (Brown C₄) had not infected a guinea-pig. The child was inoculated beginning Jan. 20, 1913, at seven-day intervals with 2, 3, 5, 7, 10 and 12 bacilli, respectively. Immediately previous to the inoculations a von Pirquet test was doubtful or negative.

March 1, 1913: A slight nodule observed on right forearm at site of a former inoculation. This nodule was at first mistaken for a staphylococcus infection.

March 10, 1913: Foregoing nodule larger. A second smaller nodule 2 inches distant, and a very minute nodule on left forearm.

March 11, 1913: These three nodules removed under chloroform anesthesia. The section of larger nodule showed numerous bacilli.

March 18, 1913: A gland noticed in right axilla enlarged. Removed.

June 14, 1914: Temperature taken through four months remained constantly normal. Child in perfect health. No evidence of glandular enlargement anywhere. Platelets, 396,000. Lymphocytes, 50 per cent. Von Pirquet tuberculin test positive.

BLOOD-PLATELETS AND TUBERCULOSIS

It has for a long time been observed that blood-platelets are increased in tuberculous infection. Osler, however, has written a scathing rebuke to the tyro who every little while claims to recognize tuberculous infection by increase of these blood elements. It seemed wise to try and investigate why Nature increases these so-called third corpuscles, knowing how rarely if ever she operates without a purpose. We have published elsewhere⁵ the following results of our observations.

1. Blood-platelets are increased in the tuberculosis of man and guinea-pigs.
2. Blood-platelets added to a small infective dose of virulent tubercle bacilli appear to modify the infection when injected into guinea-pigs.

In addition we have observed that blood-platelets are increased 12 per cent. in the blood of man and guinea-pigs at an altitude of 6,000 feet. They are also increased by hyperemia of the marrow of long bones and in poisoning by carbon monoxid.

The increase of blood-platelets in the infected Monkey 21 occurred two weeks after the inoculation of virulent tubercle bacilli, and was maintained. The number in the control animal, Monkey 23, remained consistently normal, and post-mortem examinations gave evidence that the findings had been correct.

CONCLUSIONS

1. Guinea-pigs can probably not be immunized with virulent human tubercle bacilli of cultures from which ten bacilli can cause infection.
2. The minimum lethal dose of different virulent cultures would appear to vary in number.
3. The minimum lethal dose for a *Macacus rhesus* is possibly a little larger than that for a guinea-pig.
4. It is necessary to be guided by the virulence of human tubercle bacilli as tested in the guinea-pig before the application to children.
5. After four years two children each inoculated up to five times the lethal dose for a guinea-pig are still negative to the von Pirquet reaction.

5. Webb, Gilbert and Havens: *Colorado Med.*, January, 1914; Trans. Tenth Annual Meeting Nat. Assn. for Study and Prevention of Tuberculosis.

6. In monkeys the decrease of lymphocytes as indicated in differential blood-counts would appear to be more reliable in indicating tubercle infection than the tuberculin tests.

7. Less than ten virulent human tubercle bacilli can infect a child.

ABSTRACT OF DISCUSSION

DR. WILLIAM OPHÜLS, San Francisco: What were the anatomic findings in the monkeys that were so infected? Using these very small doses of tubercle bacilli for the infection, one approximates, I presume, the natural infection more closely.

DR. G. B. WEBB, Colorado Springs, Colo.: No observations were made on the tuberculous monkeys except as stated in my paper. We usually killed the monkeys immediately infection was recognized, as indicated either by a local lesion or glandular swelling.

LYMPHOCYTOSIS AS A SIGN OF CONSTITUTIONAL DERANGEMENT IN CHRONIC DISEASES OF THE DIGESTIVE TRACT*

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NEW YORK

Of an extensive literature devoted to the rôle which constitutional factors play in the development of disease, only a small part deals with the digestive tract. In the discussion of gastro-intestinal diseases the local anatomic aspect dominates the conception of the morbid state. This conception is principally based on the demonstration of anatomic lesions at abdominal operations, which undoubtedly in many instances cleared up the true nature of a formerly obscure process. This applies, however, in particular to acute diseases; we cannot say as unreservedly that the demonstration of anatomic lesions has satisfactorily cleared up the pathogenesis of chronic diseases of the alimentary tract. In most of these chronic diseases anatomic lesions usually are the end-results of a pathologic process, but they do not necessarily indicate its working. For the understanding of its development, pathologic physiology promises better information than anatomic facts. It becomes more and more clear that disturbances of function are the causative factors of pathologic conditions in the alimentary tract: the irritative and the depressive disorders of motility and of secretion, spasm and atony, and increased and diminished secretion of the various digestive glands. When I discussed this topic last year,¹ I pointed out the necessity for studying the conditions which provoke the disorders of function. In this paper I intend to show that a general constitutional derangement very often forms the basis for the development of functional disturbances.

It has been demonstrated that the vagus and the splanchnic influence the activity of the digestive organs, although we know comparatively little of the manner in which the functioning of these opposing nervous apparatus is physiologically regulated. On the

other hand, we have learned to recognize pathologic states or irritation of both nervous systems, the "vagotonia" and "sympathicotonia" of Eppinger and Hess.² Since these authors first differentiated the two conditions, other investigators have pointed out³ that often there are in a given case as many vagotonic as sympathicotonic symptoms, so that the sharp lines between the two states as originally drawn by Eppinger and Hess should be modified. Aside from this the inauguration of visceral neurology marks a decided progress. The knowledge of chronic vagus irritation has thrown considerable light on the pathogenesis of gastric ulcer, and one may expect that further investigation of the vegetative nervous system will clear up many unexplained points in the diseases of the digestive tract.

For the present discussion I wish to call attention to the fact that patients with vagotonic or sympathicotonic symptoms at the same time very often present signs of disordered internal secretions. The relation between disturbances of the ductless glands and those of the vegetative nervous system has not been safely established. Two years ago Dr. Cannon⁴ pointed out the possibility that the glands of internal secretion play a rôle in causing disturbances in the nervous system of the alimentary canal. Dr. Cannon's work deals especially with the effect of excessive secretion of the adrenals, which affects the alimentary canal precisely as splanchnic impulses affect it, by producing a total abolition of tone and a consequent inhibition of all activity.

There is much in the clinical picture of patients with chronic gastro-intestinal diseases which strongly suggests that the influence of disordered internal secretions, in particular of the thyroid gland, is frequently the primary factor which causes the derangement of the visceral nerves. Knowing the importance placed on lymphocytosis in disordered thyroid, I have tried to find out whether blood examinations would offer a firmer basis for such a conception. I have examined 140 patients who presented the different types of chronic functional and organic gastro-intestinal diseases, from plain constipation to gastric ulcer, combined with more or less numerous signs of vagus—or sympathetic irritation. I have purposely abstained from any attempt at classification. The point which I want to emphasize is the remarkable frequency of lymphocytosis which I have encountered in this series of cases.

In my classification of lymphocytosis I considered:

1. As normal a total of 10,000 white cells or less with a differential lymphocyte count up to 35 per cent.
2. As relative lymphocytosis a total white-cell count below 10,000 with a differential lymphocyte count above 35 per cent.
3. As absolute lymphocytosis a total white-cell count above 10,000 with a differential lymphocyte count above 35 per cent.

In the differential classification of lymphocytosis mononuclears and all transitional forms were excluded, while the small and the large lymphocytes counted together were given as lymphocyte percentage.

* Eppinger and Hess: Die Vagotonie, Von Noorden's Samml. klin. 9 and 10.

† For fuller information regarding these questions see: Hemmeter: Med. Jour., 1914, p. 101. Wolfsohn, J. M.: The Normal Physiologic Physiology of the Visceral Nervous System, THE A. M. A., May 16, 1914, p. 1535.

‡ President's Address. Tr. Am. Gastro-Enterol. Assn.,

Of the 140 cases examined, 43 showed a normal lymphocyte count; 7 were on the border line; 16 showed absolute lymphocytosis, and 74 showed relative lymphocytosis. Of the latter 11 showed leukopenia, that is, a total white-cell count below 6,000, downward to 3,200.

Of the total number of 90 cases of lymphocytosis (16 absolute and 74 relative):

From 35 to 40 per cent. of lymphocytes were shown by 27.
From 41 to 45 per cent. of lymphocytes were shown by 18.
From 46 to 50 per cent. of lymphocytes were shown by 20.
From 51 to 55 per cent. of lymphocytes were shown by 20.
From 56 to 62 per cent. of lymphocytes were shown by 5.

The ninety cases of lymphocytosis represent 60 per cent. of all cases examined. Since a number of these patients reported only for mild temporary disorders and were examined as a routine, the 60 per cent of cases showing relative or absolute lymphocytosis must be considered very high.

The question is, What does lymphocytosis indicate? The examination of my patients soon made me realize that lymphocytosis is by no means as reliable a sign of exophthalmic goiter as it was formerly considered. Only a few of my patients presented symptoms which could be interpreted as caused by hyperthyroidism. I then found from the literature that during the last few years a different meaning had been given to lymphocytosis. Kocher's clinic, as Pettavel's⁵ recent publication shows, still adheres to the original conception of lymphocytosis as a direct result of hyperthyroidism. This view, however, has been challenged by a number of writers. Borchardt,⁶ Falta,⁷ and Maranon⁸ were among the first to point out that lymphocytosis is observed not only in hyperthyroidism but also in hypothyroidism, and, further, in disturbances of the other ductless glands such as the hypophysis, the adrenals, etc. These authors assert that the ductless-gland disorder is the primary disturbance, which in turn produces status lymphaticus, and they consider the lymphocytosis as a manifestation of status lymphaticus.

The linking of lymphocytosis and status lymphaticus has complicated matters so far as one forgets that we are dealing here with two distinctly different problems; first, with the relation of lymphocytosis and ductless-gland disorders, and second, with that of lymphocytosis and status lymphaticus. The definition of status lymphaticus is anything but clear. In literature we often find the diagnosis status lymphaticus merely based on the findings of blood-lymphocytosis, without any reference to the fact that these cases presented the hypertrophy of the lymphatic tissues or any of the other anatomic features, which Palttauf, and after him Kolisko, Bartel and Neusser have given as the main criterion of status lymphaticus.⁹ A good deal of confusion might be avoided if we followed Bartel,¹⁰ who proposed to confine the term "status lymphaticus" to the group of cases which are anatomically well defined by hypertrophy

of the lymphatic tissues, and differentiated this group from what he calls status hypoplasticus, which in a less restricted and broader conception denotes a general constitutional inferiority with more or less marked hypoplasia in various organs and with lymphatic systems which, although not hypertrophic, nevertheless show abnormalities. If we accept this differentiation it must be stated that according to Siess and Stoerck,¹¹ no lymphocytosis is found in true status lymphaticus, so that there is no justification for regarding lymphocytosis as an indication of status lymphaticus, as is done by most writers at present. If the findings of Siess and Stoerck are corroborated it must be declared an error to diagnose status lymphaticus merely because lymphocytosis is present. On the other hand, lymphocytosis is very frequently found in cases which answer Bartel's description of status hypoplasticus or whatever one may call this condition of general constitutional inferiority. Kahler¹² pointed out that lymphocytosis may be considered in a more general way as a manifestation of that constitutional derangement which in literature is differently described as lymphatism, lymphatic constitution, status hypoplasticus, general congenital asthenia, morbus asthenicus, infantilism, etc. This constitutional derangement is met very frequently. It may give rise to disturbances in various systems, a fact which accounts for the demonstration of lymphocytosis in so many different conditions. To quote only a few of a great number of publications: Von Hösslin¹³ and Sauer¹⁴ report the frequency of this blood-picture in all functional disorders of the nervous system which such patients are particularly prone to develop. Gudzent¹⁵ found lymphocytosis in chronic arthritis, so frequently associated with status hypoplasticus; Mohr¹⁶ in constitutional obesity, and Decastello¹⁷ in tuberculosis. The correlation of lymphocytosis and status asthenicus as developmental anomalies and predisposing factors for tuberculosis have often been discussed, lately by Bartel and Kraus.¹⁸

In the majority of my cases with lymphocytosis I noted a more or less pronounced tendency to asthenia or other manifestations of status hypoplasticus.

If it is permitted to conclude from all these findings that lymphocytosis may be taken as an indication of status hypoplasticus, the figures in my series certainly show that this constitutional derangement frequently forms a basis for the development of diseases in the digestive tract.

I have to come back once more to the question, What relation exists between lymphocytosis and disordered internal secretions? I quoted above the opinion of Kocher and others, who consider the blood-picture as secondary to the ductless-gland disorder. So far there is little proof for this contention and much may be said against it. In the first place it is difficult to understand how, as Borchardt and Falta assert, the same blood-picture should be produced by entirely different ductless-gland disorders—by decreased as well as increased thyroid secretion. I further call attention to Kocher's own reports which show that lymphocytosis remained unchanged in cer-

5. Pettavel: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1914, xxv, 748.

6. Borchardt, L.: Deutsch. Arch. f. klin. Med., 1912, cvi, 182.

7. Falta, W.: Deutsch. Arch. f. klin. Med., 1912, cvii, 103.

8. Maranon, G.: Boletín de la Sociedad Española de biología, 1911, v, 75, ref. Centralbl. d. exper. Med., 1912, ii, 158.

9. A very clear description of the physical characteristics of status lymphaticus is given by Haven Emerson in the Archives of Internal Medicine, January, 1914, p. 169.

10. Bartel: Status thymico-lymphaticus und Status hypoplasticus, Leipzig and Vienna, Franz. Deuticke, 1912.

11. Siess and Stoerck: Wien. med. Wchnschr., 1913, No. 8.

12. Kahler, H.: Ztschr. f. angew. Anat. u. Konstitutionslehre, 1913, 1, 139.

13. Von Hösslin: München. med. Wchnschr., 1913, Nos. 21 and 22.

14. Sauer, Hans: Deutsch. Ztschr. fr. Nervenhe., 1913, xlix, 447.

15. Gudzent: Deutsch. med. Wchnschr., 1913, p. 887.

16. Mohr: Verhandl. Cong. f. inn. Med., 1914.

17. Decastello: Wien. med. Wchnschr., 1914, p. 669.

18. Kraus, F.: Deutsch. med. Wchnschr., 1913, p. 194.

tain cases of exophthalmic goiter after the overactivity of the gland was successfully checked by operative treatment. This suggests that lymphocytosis is an indication of some factor other than hyperthyroidism.

In his monograph on status lymphaticus, Neusser¹⁹ suggests the possibility that the lymphatic tissues produce a secretion which acts as the antagonist of epinephrin, and that abnormal lymphatic tissues may cause a disturbance of this secretion, which in turn upsets the activity of the other ductless glands. More light will have to be thrown on this problem before we can speak of a causal relation. Until then it seems safer merely to record that lymphocytosis and ductless-gland disorders are frequently associated, or, to express it differently, that persons with status hypoplasticus are inclined to disorders of internal secretions. It seems that they are particularly predisposed to thyroid insufficiency, possibly on account of fatigue when more demands are made on them than their constitutional derangement permits them to bear.

In my series of cases, symptoms of thyroid insufficiency were decidedly predominant. I wish to mention here that in 1907 Dr. Sawyer²⁰ discussed the frequent relation of digestive disorders and thyroid disturbances and reported diagnostic blood-pictures. Dr. Sawyer designated his cases as incomplete forms of exophthalmic goiter. Most of my own cases presented symptoms which, according to the teaching of Hertoghe, Levi and Rothschild, Saenger and others, are the result of the thyroid insufficiency, so that instead of *formes frustes* of Graves, one should speak of *formes frustes* of myxedema, or as others have called it, of chronic benign hypothyroidism. The correct interpretation of the thyroid disorder is important for purposes of treatment. It is true that we should not differentiate too sharply, since it is known that overactivity as well as insufficiency of the thyroid may at different times occur in the same patient; and then, too, it is becoming more and more evident that thyroid disorders are rarely observed alone, but that as a rule they are combined with other ductless-gland disorders; yet there can be no doubt that in most cases one type of disorder is distinctly preponderant.

Of the signs attributed to hypothyroidism observed in my patients the most frequent symptoms pointing to retarded metabolism were: congestion of the liver associated with bilious attacks, headaches and migraine; tendency to fatigue, lack of ambition, mental depression, low blood-pressure, impaired circulation and cold extremities. In most of these cases a small thyroid gland was found which permitted palpation of the tracheal rings down to the sternum. Of the symptoms referable to the alimentary canal, I mention atony of the stomach and intestines with constipation and congestion of the mucous membranes causing a tendency to chronic inflammatory processes; when associated with symptoms of vagotonia, irritative disorders of the stomach, hyperacidity and hypersecretion, spastic conditions in various parts of the digestive tract from the esophagus down to the anus with all its sequelae, gastric ulcer, spastic constipation, mucous colitis, adhesions following inflammatory processes in the various organs and their mechanical results.

I wish to state that I observed some cases with symptoms of hypothyroidism in the digestive tract as

well as in other organs which showed no lymphocytosis, although their number was small as compared with the number which presented lymphocytoses.

In a number of cases presenting symptoms of hypothyroidism I had excellent results from the administration of thyroid. This was particularly instructive in cases of children suffering from malnutrition who were subject to gastric atony, constipation, congestion of the liver, headaches, etc., and who were freed of these disorders by thyroid medication. I observed cases of gastric hyperchlorhydria which had stubbornly resisted all other methods of treatment, and which then were relieved by taking thyroid. The same beneficial effect of thyroid therapy was experienced in other gastro-intestinal disorders when they were associated with chronic benign hypothyroidism.

I shall not discuss any further ductless-gland disorders and thyroid therapy, and I shall be very careful not to generalize. The report of successful thyroid treatment in my cases was merely meant to show that there are possibilities of causative treatment once we recognize the constitutional derangement and the disorders which it leads to. But valuable as such more specific forms of treatment are, there is a more important lesson to be learned from the present discussion; and this is, that the constitutional factor which I so often found at the bottom of chronic gastro-intestinal disorders should be given full consideration in the general management of such patients.

The periodicity which characterizes most chronic digestive disorders indicates that general conditions, such as constitutional derangements, are the decisive factors in the development of the disorder and not the anatomic lesions which are end-results. This is particularly evident in gastric-ulcer cases; and whether when treating them we shall succeed in avoiding recurrences will not depend so much on the employment of any special form of ulcer treatment, and in operative cases not on improved technic or new methods of operation, but it will depend to a much greater extent on our ability to regulate the patient's mode of living and on the patient's ability to observe general hygienic and dietetic principles and rules, which consider not only his local disorder, but in the broadest possible way his constitutional make-up, his mental state, his work, his habits, etc.

We are fully familiar with such conceptions for other diseases. It is generally understood that epilepsy develops on the basis of a constitutional disposition, and that this disposition must constantly be the object of treatment no matter whether the individual attacks are provoked by constipation, by the irritation of scar tissue, or from any other cause. There is no difference of opinion regarding the necessity of persistent hygienic and dietetic treatment in tuberculosis, if we want to succeed in fighting the ravages of the tubercle bacilli; and this is precisely the same situation which confronts us in many chronic gastro-intestinal disorders. We must emancipate ourselves from the narrow view which considers only the local disorder, be it ever so pronounced, and take into account the fact that a constitutional derangement is often the basis for the development of most of these local disorders, and that this constitutional derangement necessitates as persistent general treatment as it does in epilepsy, tuberculosis and other diseases. I hope that I have made this clear.

52 East Fifty-Eighth Street.

19. Neusser: Zur Diagnose des Status Thymico-Lymphaticus, Vienna and Leipsic, W. Braumüller, 1911.

20. Sawyer: New York Med. Jour., July 15, 1907.

THE SPECIFIC ACTION OF SALICYLATES IN
ACUTE ARTICULAR RHEUMATISM*

JOSEPH L. MILLER, M.D.

CHICAGO

Maclagan in 1874 was apparently the first physician to ascribe to salicylates a specific action in the treatment of acute articular rheumatism, although in the discussion following his report an English army surgeon in South Africa related that a decoction of willow bark was a favorite remedy among the Hottentots in the treatment of painful joints. His use of the remedy was purely empirical. He believed, on account of the profuse perspiration, that rheumatism was closely related to malaria; that in certain regions where malaria is prevalent the cinchona grows and that, therefore, in local surroundings especially favorable for the development of rheumatism, search should be made for a specific. As dampness predisposes to rheumatism, the search was begun among those plants growing in low grounds; early he examined the willow, and from this obtained the salicin, which he hailed as a specific.

The following year (1875) Buss and Riess,¹ and also Stricker² apparently independently of Maclagan recommended, on account of its antiseptic power, salicylic acid. Senator in 1876, also independently of Maclagan, recommended salicin, as, according to Ranke, Lehman and others, it was converted into salicylic acid in the stomach. The introduction of salicylic acid at this particular time can be accounted for by the introduction in 1874 of Kolbe's process of manufacturing it. Although salicylic acid was first made by Pagenstecher in 1835, it was not until Kolbe's discovery that it could be produced at a moderate cost.

The use of the salicyl preparation in rheumatism became quite general in both England and Germany during the late seventies, and especially in the English medical journals of that date an interesting discussion was carried on as to whether or not this group of drugs really possessed great therapeutic value in arthritis. On either side of the question could be found some of the best medical men of the day. It is largely from the literature of this period that we can obtain abundant statistical data.

Regarding the supposed method of action, this was considered purely bactericidal, the first preparation used in Germany being salicylic acid, which, as is well known, is a very powerful germicide. It is a general cellular poison, toxic to the cells of the body, and, as far as we know, has no selective action for bacteria. It was overlooked at this time that the salicylic acid on leaving the stomach is converted into a salicylate and appears in the circulation and comes in contact with the tissues in this form. If, therefore, its action is bactericidal, it must be reconverted in the tissues into salicylic acid. Salicylic acid is rapidly and completely eliminated through the kidney chiefly in combination with glycocholic acid, as salicyluric acid; a very small amount may be excreted as salicylic acid. Inasmuch as drugs may have a selective action for certain tissues, it is possible that this selective action may be

manifested by the inflamed joints, and if so there may be conditions present making possible the conversion of the salicylates into the salicylic acid. Fillipi and Nesti have shown that in man two hours after the administration of acetylsalicylic acid a test for salicylate could be obtained from the synovial fluid. Bondi and Jacoby³ gave rabbits 0.57 gm. of salicylic acid and later determined its presence in the various fluids and tissues of the body. They found much larger amounts in the muscles and joints than in other tissues, and at times it could be demonstrated in the cartilage and synovial membrane and not in other tissues. They did not show, however, in what combination the salicylic acid existed. This is after all the most important point, as the salicylates do not have any germicidal action.

As all the tissues of the body have an alkaline or neutral reaction, the sodium salicylate cannot be converted into salicylic acid in the tissues unless, as Binz⁴ has suggested, in the presence of increased carbon dioxide tension. Both Binz and Ewald⁵ were able to show that the carbonic acid tension is from 5 to 7 per cent. higher in inflamed tissues than it is in the blood, even in extreme cyanosis, and that the blood in extreme cyanosis is capable of freeing the salicylic acid from its salt. Binz also demonstrated that an alkaline fluid containing sodium salicylate, if impregnated with carbonic acid to the degree found in inflamed tissues, would permit of the breaking up of sodium salicylate, and the setting free of salicylic acid. Although this has not been shown to actually occur in the joints in arthritis, on theoretical grounds it is at least possible.

Previous to the introduction of salicylic acid, acute arthritis was treated by the use of alkalies, heat, counter irritation and venesection. Under these methods, the results of treatment were generally conceded as better than with the expectant method. With the introduction of salicylic acid, there was abundant opportunity for comparative observation of the value of this new therapeutic agent. These observations consisted of statistical collections and personal impressions. It is of interest to note that even at this time the best men in the profession did not consider the drug as a specific in the sense we use this term with quinin or mercury, but rather debated whether this new treatment was superior to the old. On account of the variable duration of the disease, the sudden improvements and relapses, it is extremely difficult to draw accurate conclusions, except by carefully compiled statistics extending over a considerable period of time. Southey⁶ most appropriately stated in 1879 at the time when the discussion of the value of salicylates was at its height that "there are few diseases, perhaps, which present more dangerous pitfalls to the unwary and clinically ill informed in therapeutics than rheumatism." Before the use of salicylates, Southey, Gull and Sutton, and others had divided acute articular rheumatism into two groups: one in which the disease ran a short course, the symptoms all subsiding about the eighth or ninth day; a second, relapsing type when about the eighth or ninth day a mitral murmur appeared, and in these cases the apparent recovery was followed by a relapse which might continue for sev-

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Riess, L.: Nachtrag zur innerlichen Anwendung der Salicylsäure, insbesondere bei den acuten Gelenkrheumatismen, Berl. klin. Wchnschr., 1876, xiii, 86.

2. Stricker: Ueber die Resultate der Behandlung der Polyarthritidis rheumatica mit Salicylsäure, Berl. klin. Wchnschr., 1876, xiii, 1.

3. Bondi, S. and Jacoby, M.: Ueber die Verteilung der Salicylsäure bei normalen und infizierten Tieren, Beitr. z. chem. Physiol. u. Path., 1906, vii, 514.

4. Binz, C.: Die Einwirkung der Kohlensäure und Salicylsäure Natrium, Arch. f. exper. Path. u. Pharmacol., 1879, x, 147.

5. Ewald, C.: Arch. f. Anat. u. Physiol., 1876, p. 446.

6. Southey, R.: Treatment of Acute Rheumatism by Salicylate of Soda, St. Bartholomew's Hosp. Rep., 1879, vi, 7.

eral weeks. These observations are of interest as suggesting the possible importance of endocardial involvement accounting for the relapses and protracted duration.

In considering statistics two points have been observed: the time of disappearance of pain after entering the hospital, and the average period that patients, with and without salicylates, remained in the hospital. These two points were selected, first, because the pain, while purely subjective, yet is so constant that its subsidence may be considered as a fair index of the disappearance of the acute symptoms. On the other hand, relapses are so frequent and moderate tenderness so often persists long after disappearance of the acute pain that the patient's statement must often be considered relative; for this reason the period of time spent in the hospital may be taken as the time required for an actual cure plus the necessary period of convalescence. On account of the antipyretic action of the salicylates, the duration of the febrile period is of little value. In going over the literature all extensive series of cases in which these two points were recorded have been taken; unfortunately from the standpoint of accuracy, the number of observers is small. While both sets of figures are based on the duration of the disease from entrance to the hospital, rather than from the time of actual onset, for comparative purposes this does not impair the result.

Considering the first point—the time at which pain disappeared after entering the hospital—Reihler⁷ reports 638 cases with salicylate, average duration of pain being 5.1 days; 425 cases without salicylates, average duration of pain 9.8 days. Pribram⁸ reports 541 cases with salicylates, with average duration of pain 6.5 days; 354 without salicylates, average duration of pain 10.4 days. Reisz treated 79 cases with salicylates, the average duration of pain being 5 days, and 124 without salicylates, with average duration of pain 21 days. In all 1,258 patients were treated with salicylates with average duration of pain 5.3 days, 974 without salicylates, average duration 13.4 days. In addition, Hood⁹ reports 350 cases, in 80 per cent. of which under salicylate the pain disappeared within 9 days and 311 without salicylates, with disappearance of pain in only 40 per cent. of cases within 9 days.

These statistics show that the duration of pain in the joints is much lessened by the use of salicylates. Still, 30.3 per cent. of those receiving salicylates, but only 6 per cent. of the untreated, have one or more relapses, and this was not considered in the statistics, as the time reported is that of the first disappearance of pain. For this and other reasons, especially the absence of the personal equation, the average period of time the patients remained in the hospital is probably more accurate and of more value.

Fortunately, extensive statistics on the time that patients remained in the hospital previous to and since the introduction of salicylates are available.

Perhaps one of the most striking features of these statistics is the uniformity of the period spent in the hospital. These figures include all the available extensive series except 417 cases given the alkaline treatment by Fuller and reported in 1863, in which the average period in the hospital was 20.1 days. As these

figures are so at variance with those reported by others using the same treatment, they have been purposely omitted from the table. At this early period of salicyl therapy the dosage was large; 15 to 20 grains every two to three hours was considered a moderate dose and many gave 300 grains a day. For this reason the criticism cannot be urged of insufficient dosage.

The information to be drawn from these statistics is that the pain and evidence of active inflammation in the joint is controlled at least temporarily by salicylates. On account of relapses and slight joint involvement, the actual complete recovery of the patient has not been materially modified by the use of salicylates. It would appear that the drug shortened the period of local inflammation in the joint, and apparently prevented new joint infection. The generalized infection, however, ran its usual course. This may be due to the bactericidal action of the salicylic acid which is set free owing to the increased carbonic acid tension in the inflamed joint. None of our present theories, however, provide for the presence of free salicylic acid in uninflamed joints, which would be necessary in order to account for failure of new joints to become involved after the use of salicylates. Fre-

* PERIOD PATIENT REMAINED IN HOSPITAL WITH AND WITHOUT SALICYLATES

Observer	No. Cases	With, Days	No. Cases	Without, Days
Warner	342	34.9	387	36.2
Pribram	429	29	...	...
Reisz	79	35.8	134	39.2
Badt	158	36	156	34.5
Putnam	455	32.9	353	32.8
Thompson	...	...	147	31.3
Chamberlain	...	...	57	34.7
Dickinson	...	...	131	33.13
Sibert	...	...	57	34.7
Southey	51	32.5	...	...
H. Hall	38	34	16	33
Coupland	84	36	...	...
Finley and Lukas	60	29.7	98	29.4
Owen	156	23	29	26
Russell	55	38	35	39
Total	1,907	...	1,600	...
Average	...	33.28	...	33.6

quently, however, in spite of the use of salicylates the joint infection continued to recur, either not being affected by the salicylates, or, after being held temporarily in abeyance, again becoming active. Relapses may occur even while the patient is receiving large doses of salicylates; in one report a relapse occurred while the patient was taking daily doses of 13 gm. Miller¹⁰ in a recent review of this subject states that of seventeen relapses, eleven occurred while the patient was still taking salicylates. Five of these were taking daily not to exceed 50 grains, four not to exceed 100 grains; one taking 150 to 200 grains; one taking 200 to 250 grains. These patients were all children and while the ages of these particular patients are not given, judging from references elsewhere in the article, they were probably under 10 years. The temporary improvement with later relapses lead to the view that salicylates were responsible for these. It is probable, however, that in the untreated cases the course of the disease was unmodified, while in those receiving the salicylates temporary lulls occurred in the local manifestation.

7. Reihler, M.: Statistisch Erhebungen über die Resultate der Behandlung der Polyarthrits rheumatica mit Natron Salicylicum, München. med. Wchnschr., 1886, xxxiii, 368.
8. Pribram, A.: Der acute Gelenkrheumatismus, Vienna, 1899.
9. Hood, D.: Statistics in Connection with the Treatment of Acute Rheumatism by Salicylates, Lancet, London, 1881, ii, 1119.

10. Miller, R.: The "Specific" Use of Salicylates in Acute Rheumatism: A Consideration of Practical Objections, Quart. Jour. Med., July, 1913, p. 519.

It would appear that salicylates are not the only therapeutic measures which affect favorably the acute symptom of rheumatism. High degrees of heat may act in much the same manner, causing the acute pain to disappear, only to return again after the treatment has been discontinued. So accustomed are we to use salicylates freely in all patients with acute arthritis that we are not in a position to judge of its value compared with other forms of treatment. During the past winter, for a period of two months, all acute arthritis patients on my service at Cook County Hospital received sweats and alkalies, but no salicylates; the temporary results were most gratifying. Tenderness and stiffness almost invariably disappeared within a week and the patient reported he was well. Within a week of the time the treatment was discontinued, however, 30 per cent. of these cases relapsed. The results, however, were very interesting, as shown that other agencies than salicylates have a decided favorable action on the acute symptom of acute articular rheumatism.

From the information at hand it would not appear justifiable to refer to the salicylates as a specific in acute articular rheumatism but rather as a drug which modifies the course of the disease, without actually shortening the period of infection.

All authorities agree that salicylates have not lessened the frequency of cardiac complication. Taking Pribram's statistics collected from various sources, 28.8 per cent. of cases receiving salicylates and 23.4 per cent. without salicylates developed cardiac complication.

Regarding the dangers of salicylates, these are confined chiefly to the effect on the kidney. It is very doubtful whether the condition ascribed by Lees to acid intoxication was really due to the drug, but rather to the intoxication from the disease. We have evidence from several sources that salicylates irritate the kidney and may excite a mild nephritis: Klieneberger and Oxenius,¹¹ Luthje, Frey and Glaesgen.¹² The disturbance, however, is temporary and soon subsides even though the salicylates be continued. According to Frey, the kidney irritation can be largely avoided by the use of alkalies. Gastric disturbances are common but not of a serious character, as they promptly subside when the drug is discontinued. Large doses at times may produce symptoms of collapse with slowing of the pulse and respiration. Seiler reports the death of a 7-year-old child after 5 gm. of sodium salicylate; Hogg, a death after two doses of 2 gm. each; Gubler, one after 10 gm.; Goodhart, one after doses totaling 3.6 gm. Quincke reports a death, in which the predominant symptom was dyspnea, after a three days' daily dose of 12 gm.

Since it has been possible to obtain cultures of a streptococcus from the joints of men with acute articular rheumatism, it might be thought possible to determine the effect of salicylates by a bacteriologic study of the joint contents. This is apparently impossible on account of the very transient presence of the germ in the affected joint. Rosenow has found that the micro-organism can be obtained only when cultures

are made within a few hours after the appearance of the joint involvement. There remains the field of animal experiments, as joint involvement analogous to the acute articular rheumatism of man can be produced in rabbits by intravenous injection of the streptococcus obtained from the joints of man. Rabbits might be infected and one group then given salicylates and the remainder used as controls. Cultures could be made from the joints at frequent intervals to determine whether the micro-organisms are less abundant or disappear more rapidly in the treated animal. Here again the inconstancy of positive cultures and the difficulty of obtaining sufficient fluid from the joint to make a culture render this method unsatisfactory. Furthermore, frequent puncture of the joint is liable to lead to secondary pus infection. Another method of procedure is to place the animal under salicylates before the inoculation and determine whether this has any effect on the rabbit's susceptibility to joint involvement. If the salicylates act through their germicidal properties, it should be manifested in an experiment of this character.

Young rabbits were selected, as they are much more susceptible to joint infection. The salicylate in 5-grain daily doses was given subcutaneously. This dosage is not excessive, being equivalent to about 250 grains in man. It is true that this was given in a single dose, but none of the rabbits showed any immediate ill effects. Two series of six rabbits each have up to the present time been submitted to this test by Dr. D. J. Davis. In one series a streptococcus was obtained from the tonsils of a patient with acute arthritis; a second series was inoculated with a culture obtained by Dr. Rosenow directly from the joint of a patient with acute arthritis. In each series three rabbits received the salicylate for several days preceding and for a week or more following the inoculation. The other three rabbits did not receive salicylates. The six rabbits received simultaneously an intravenous injection of streptococci. The animals were then examined daily, the number and extent of joint involvement noted, and after the lapse of a week the animals were killed; the involved joints opened and examined. The two series of six rabbits each submitted to this test did not show that the salicylates had any effect either in preventing joint involvement, or modifying the intensity of the same. At a later date when this work is completed it will be published in detail.

SUMMARY

As salicylic acid after absorption circulates and appears in the tissues as a salicylate, it cannot act as a germicide unless the increased carbonic acid tension in the joint, the result of inflammation, reconverts it into salicylic acid. Statistics show that patients receiving salicylate are free from pain much earlier than those not treated. As the treated patients much more frequently relapse than the untreated, however, the total duration of pain in the treated and untreated patients may not be materially different. The period of stay in the hospital of patients receiving salicylate and of those receiving other forms of treatment is the same. Cardiac complications are not less frequent since the use of salicylates. In rabbits the prophylactic use of salicylate is of no value in preventing arthritis after intravenous injections of hemolytic streptococci.

122 South Michigan Avenue.

11. Klieneberger and Oxenius: Ueber Urine und Urinsedimente bei normalen Personen, bei rheumatischer Erkrankung und nach der Einwirkung von Salicylpräparaten, *Deutsch. Arch. f. klin. Med.*, 1904, lxxx, 225.

12. Glaesgen: Ueber Nierenreizung durch Salicylpräparaten und ihre Aufhebung durch Alkalizufuhr, *München. med. Wchnschr.*, 1911, lvi, 1125.

ABSTRACT OF DISCUSSION

DR. WARREN COLEMAN, New York: My experience with salicylates in acute rheumatic fever is not in accordance with what would appear from Dr. Miller's analysis of cases. Has Dr. Miller considered the size of the doses which were used in certain cases? Some years ago a paper by Lees appeared in the *British Medical Journal*. His treatment of rheumatic fever with the salicylates differed materially from any which I had seen described. He recommended the use of salicylate up to 500 or 600 grains a day. I continued, however, to use 20 grains of a salicylate every two hours and 40 grains of sodium bicarbonate until recently, when the size of the dose has been increased. I have been greatly gratified by the results. Lees believes that the salicylates are just as specific for this disease as salvarsan is for syphilis or quinin for malaria. While I am not prepared fully to endorse this statement, the symptoms of the disease usually disappear in from twenty-four to thirty-six hours after the administration of the large doses. Lees states that the salicylates should always be combined with twice the quantity of sodium bicarbonate as otherwise a condition resembling acidosis may develop. Another point he makes is that the drug should be discontinued on any day that the patient's bowels do not move.

DR. LAWRENCE LITCHFIELD, Pittsburgh: Has Dr. Miller collected any observations as to the frequency of endocarditis? Krause believed that cases with full salicylic acid treatment showed a smaller percentage of endocarditis; and also in cases of tonsillitis in which rheumatic complications were feared he believed in giving salicylic acid. I know Krause believed in the specificity of salicylates for rheumatism and gave from 0.5 to 1 gm. every hour, day and night, until the patient improved. There was no mention of sodium bicarbonate or acidosis. His convictions must count for something even in the face of these statistics. The question is not whether the patients get salicylates, it is whether they get saturated with them. Krause used salicylic acid in this way and rarely needed to continue it more than twenty-four or, at most, thirty-six hours. When not well borne he gave diplosal, which I have found very satisfactory.

DR. BERNARD FANTUS, Chicago: If I rightly understand the points made by Dr. Miller he did not deny value to salicylates in the treatment of rheumatism. I believe he admitted analgesic value; but the point made is that there was no diminution in the duration of the disease. With both of these propositions I can heartily agree. His statistics show that the salicylates do not seem to have antibacterial action in this disease.

DR. JOSEPH L. MILLER, Chicago: All these statistics were collected between 1876 and 1884. At that time 200 to 300 grains were given daily, so the objection to small doses does not hold good. The only point about Lees' paper which interests me is that relapses will occur and two-thirds of the relapses occur while the patient is taking the salicylates. Relapses, however, are fewer under larger doses than when smaller doses are given. I judge that the salicylates do modify the course of the disease just the same as sweats and heat modify it. The fact that the symptoms return after the stopping of the salicylates is proof of his fact. The duration, however, I believe is not especially modified.

Influence of Arabian Medicine.—The influence of Arabian medicine on modern medicine can, perhaps, best be judged from the number of words in our modern nomenclature, which, though bearing Latin forms, often with suggestion of Greek origins, still are not derived from the old Latin or Greek authors, but represent Arabic terms translated into Latin during the Renaissance period. Hyrtl, without pretence of quoting them all, gives a list of these which is surprising in its comprehensiveness. For instance the mediastinum, the sutura sagittalis, the scrobiculus cordis, the marsupium cordis, the chambers of the heart, the velum palati, the trochanter, the rima glottidis, the fontanelles, the alae of the nose, all have their present names, not from Latin, but from Arabic terms.—Walsh, *Makers of Medicine*.

ARTIFICIAL PNEUMOTHORAX AND PREGNANCY

CASE REPORT

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The case cited below is an interesting example of what the human organism may accomplish with a little help, and a striking example of the efficacy of induced pneumothorax under some very unfavorable circumstances.

History.—Mrs. F. W., aged 24, born in Illinois, was referred to me Jan. 1, 1914. Grandparents on both sides lived to 90 years of age and over. Mother died of pneumonia. Father died of pulmonary tuberculosis at age of 36. Two brothers and five sisters are living and in good health. One sister died of pulmonary tuberculosis at age of 19. Patient had none of the diseases of childhood, but has always been very frail. She married at 20 and gave birth to healthy baby boy two years later. She nursed baby for one month. About this date slight cough and expectoration appeared, and the patient had daily afternoon fever and began to lose weight rapidly. In February, 1912, she had sweats nightly for about one month. Tubercle bacilli were demonstrated in the sputum at this time. From February to August, 1912, treatment consisting of rest, outdoor living and forced feeding was tried in Illinois without material gain. In August, 1912, a change to Colorado was advised. Patient entered a sanatorium in Colorado Springs and remained there ten months. Fever gradually declined so that by the end of the third week in the sanatorium, temperature was normal and remained so for over ten months. During the first four months patient gained 22 pounds. Patient left sanatorium in June, 1913, 25 pounds heavier, pulse and temperature at a normal level, but still coughing and raising slightly in the morning. On leaving sanatorium she took up housekeeping, doing almost the entire house work. In August, 1913, she became pregnant. In September cough and expectoration increased considerably and afternoon fever of 100 reappeared. During November and December she lost strength and weight very rapidly, and had afternoon fever ranging from 101 and 102.5 at this period.

Examination and Treatment.—Jan. 1, 1914, patient was referred to me for examination and the performance of artificial pneumothorax if advisable. Physical examination showed a poorly developed and emaciated body. The left lung disclosed signs of active trouble from apex to base. Right lung was apparently clear. Temperature was 101, pulse 110. Artificial pneumothorax was advised.

January 15, temperature at 11 a. m. was 99.6, pulse 112. At 8 p. m., temperature 101.5, pulse 120. Urinalysis: Specific gravity 1.020; no albumin or sugar; no casts.

January 16, the first injection, 900 c.c. gas, was given at 11 a. m. Temperature at 2 p. m. was 101, at 4 p. m. 101.6, at 8 p. m. 101.8. Pulse from 110 to 120. There was considerable pain and no sleep the first night, with abundant expectoration.

January 17, temperature at 8 a. m. was 98.2, 12 m. 99.2, 4 p. m. 99.6, 8 p. m. 100.2, pulse from 100 to 120. Expectoration was considerably less.

January 18, temperature at 8 a. m. was 98, 12 m. 98.8, 4 p. m. 98.6, 8 p. m. 98.6. Pulse from 100 to 110. There was very little expectoration after morning clearing out. On the morning of the 18th a second injection of 400 c.c. was given. Temperature remained normal from this date until two weeks before labor. Pulse ranged from 80 to 86. During this period patient gained rapidly in strength and 15 pounds in weight; cough and expectoration ceased entirely. The injections of gas were continued at regular intervals during the pregnancy.

Two weeks before labor patient had afternoon fever of from 99 to 100. Urinalysis at this date revealed a specific gravity of 1.032; albumin, trace; no sugar; no casts. Fever

continued until two weeks after labor, after which temperature gradually dropped to normal, pulse ranging from 80 to 90, which conditions have existed without variation up to present date. No cough or expectoration. Labor occurred April 29, 1914, was of seven hours' duration and normal in every respect. One hypodermic injection of pituitary extract was administered fifteen minutes before delivery of head.

Recovery was uneventful. Temperature became normal two weeks after confinement, and at the end of the third week patient was able to be wheeled out in chair. Six weeks from date of labor patient was up and out and apparently well in every respect. Gas injections are still being administered at regular intervals.

In my experience with artificial pneumothorax, now numbering over sixty cases, I have had but one case of pregnancy in the series, from which one cannot draw conclusions. I simply wish to add this testimony to other data now in the process of collection, from which some conclusions may be drawn at a later date.

INTESTINAL STASIS

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The term "intestinal stasis" originated with Sir Arbuthnot Lane. The chronic variety of intestinal stasis this eminent surgeon¹ defines as follows:

Such an abnormal delay in the passage of the intestinal contents through a portion or portions of the gastro-intestinal tract as results in the absorption into the circulation of a greater quantity of toxic or poisonous materials than can be treated effectually by the organs whose function it is to correct them into products as innocuous as possible to the tissues of the body.

The main cause for chronic intestinal stasis Lane attributes to visceroptosis and formation of kinks. Bainbridge,² one of Lane's most ardent followers, says:

The natural outcome of this kinking of any portion of the drainage tube is obstruction of the lumen of the intestine at the point of the kink with "puddling" in the dependent portion, damming back and infection of the contents, and general slowing of the drainage of the canal.

The symptoms are briefly, headaches, nausea with vomiting, anorexia, loss of weight, cold extremities, mental apathy, constipation, bad taste in mouth, abdominal distention, muscular pains.

The diagnosis is based on the discovery of existing visceroptosis or intestinal kinks (which are best demonstrated by Roentgen rays), in conjunction with a delay in the intestinal prochoresis. For the recognition of the latter Patterson uses the charcoal test. He gives two teaspoonfuls of charcoal and gauges the time of its appearance in the stool. If charcoal does not appear within sixty hours, there is intestinal stasis.

The treatment consists, in mild cases, in an appropriate abdominal support and the administration of liquid paraffin, and in severer cases, in ileocolostomy (short circuiting the bowel) or colectomy.

This, in short, is a brief résumé of Sir Arbuthnot Lane's teaching.

This subject is not a mere theoretical one but presents issues of great practical importance, dealing sometimes with situations endangering life.

I feel forced, therefore, to lay my views, which are quite contrary to Sir Arbuthnot Lane, before the profession.

I would like to mention first that visceroptosis giving rise to intestinal angulations (designated as "kinks" by Lane, and the formation of partial stenoses with delayed prochoresis, originated with F. Glénard. Whatever credit be due for this conception, it belongs to Glénard and not to Lane.

The second point, that of intestinal stasis leading to the absorption of poisons within the intestine, or auto-intoxication, is a theory which was advanced long ago, principally by French clinicians, Bouchard, Combe, and others. This theory has been made by Lane and his disciples the foundation for their plan of treatment. The digestive canal is called a "drainage tube" and compared to a sewer system, in which any clogging must cause disaster.

For our own satisfaction let me say that our organism is not so poor an engine as it is depicted by the adherents of the "stasis" theory. If our body is resourceful, as you all well know, in adequately fighting enemies that it has never before encountered—pneumonia, typhoid fever, etc.—how much more must we expect from it in the way of every-day defenses. It is surely well fitted to debar the entrance of harmful digestive products through the intestinal wall, for this is a continuous happening.

Unless there is a real mechanical obstruction or some substantial organic lesion interfering with the intestinal current, a temporary delay or stasis of the contents may not mean much. At times this delayed prochoresis may serve to make absorption more complete, and is encountered in instances of insufficient nutrition.

Now a word with regard to the auto-intoxication theory, as far as it concerns intestinal stasis or habitual constipation (for this is only another name for it). Constipation does not cause auto-intoxication. For, occasionally, a patient may have no bowel movement for several days and present no abnormal symptoms whatever. The symptoms frequently associated with chronic constipation may be ascribed to nervous disturbances, and not to auto-intoxication. Reassurance and nerve sedatives will often do more good than drastic measures.

We now come to the last point, namely, that of treatment. In mild cases Lane, following Glénard, recommends an appropriate abdominal supporting bandage. To this I fully agree. In the severer type Lane recommends operative measures; ileocolostomy or colectomy. With this radical plan of treatment most clinicians and some eminent surgeons do not agree.

If we did not need the colon, which is an organ of considerable length, we would not have it, or it would show decided signs of degeneration; but this is not the case.

Ileocolostomy, or colectomy, is justifiable in cases of cancer or stricture of the bowel, but not in functional disturbances. Albu³ has shown that while it is possible to exist without a colon, an individual deprived of this organ is subject to great dangers and easily succumbs to intestinal diseases with which an ordinary person can cope without difficulty.

In addition, there are the dangers of the operation, and ultimately the uncertainty of a cure after exclusion or removal of the colon.

1. Lane, W. A.: Surg., Gynec. and Obst., November, 1910.

2. Bainbridge, W. S.: A Contribution to the Study of Chronic Intestinal Stasis, Med. Rec., New York, Sept. 27, 1913.

3. Albu, A.: Versuche über Ausschaltung des Dün- und Dickdarms, Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1909, xix, Part 5, p. 852.

Therapeutics

PREVENTION GREATER THAN CURE

LIFE PROBLEMS

The "survival of the fittest" begins with the germ of reproduction, goes through embryonic life, through parturition, through infant life, through childhood, and presumably should be considered as ultimately satisfied at 20 years of age, but it is not perfectly satisfied until another individual emanating from this "fit" individual of 20 years or more has also reached the age of 20. Such, theoretically, may be considered the "survival of the fittest."

It is the object of this series of articles to cause medical men to review the knowledge already acquired of the means and methods of causing more "fit" to be born, and more "fit" to survive and have their health unimpaired by preventable disease.

To show how lavishly nature provides at the start for the survival of the fittest, it should be noted that each human male having normal sexual health and living until the age of 60 is said to produce more than 300 billions of spermatozoa, while the ovaries of the human female are said at puberty to contain about 30,000 eggs. This is not to suggest that the world would be happier with an enormous increase of individuals, but it will be happier, and there will be less poverty, if there are more normal individuals and fewer abnormal ones. The economic value of wars and plagues need not be discussed, but it should be remembered that the strongest men (the most "fit") are the ones who die in battle, and that pestilences destroy the "fit" as well as the "unfit."

The great sterilizer of men and women, especially the latter, is gonorrhea; the great abortionist is syphilis. And again, these diseases are likely to be acquired by the "fit" among our men, and, unfortunately, often innocently acquired by the "fit" among our women. Therefore, war, pestilence, gonorrhea and syphilis entail an inferior progeny, and hence economically and socially are deplorable.

Most infectious diseases leave the individual less "fit," although after surviving an acute onslaught of some one or more of these diseases he may acquire an immunity to the germs and to infections in general, and he may even, as years go on, transmit more or less of such immunity to his offspring. Or, on the other hand, he may transmit a susceptibility to certain germs to his offspring. Most severe attacks, and even mild attacks, of infection leave permanent marks on the individual, even though he survive. Hence the great purposes of medical men, to-day, are: (1) to prevent disease; (2) to produce anti-vaccines that will protect or cause immunity to a disease without so disturbing the organism as to cause permanent lesions or damage to tissues; (3) if an antivaccine cannot be produced, to discover an anti-toxin that will rapidly inhibit the infection when it occurs; (4) to advance physiology and chemistry so that the needs of a defective organism may be supplied by the organic extract of the knowledge now acquired by the dissemination of diet and food values; (5) to discover the conditions that cause infectious diseases and their prevention.

THE COLON BACILLUS

We harbor, more or less normally, some germs that may become pathogenic, notably the colon bacillus. The part this germ plays in causing acute inflammation or chronic disintegration of organs is variously stated, but it seems ever ready to attack us when our armies of protection are reduced in number or are otherwise engaged. It has been suggested that this germ or its toxins may be a cause of neurasthenia, arteriosclerosis and chronic nephritis, if not of liver disturbances and cerebral disturbances. It has been shown to cause appendicitis, cholecystitis, and perhaps pyelitis. It is thought by some to be a cause of the ever-frequent duodenal and gastric ulcers. It may play an important part in the pernicious anemias, which are now thought to be generally due to an infection. Not infrequently, in acute disease, complications occur which are attributable to the colon bacillus or its toxins. Often some chronic catarrh has been shown to be complicated, if not caused, by infection with the colon bacillus.

Whether there are other normal bacilli in the human body that under certain conditions may become pathogenic has not been discovered, but certain it is that in the prevention of disease we must take into consideration not only the infective but the putrefactive power of the colon bacillus. The prevention of putrefaction in the intestines will promote the immediate health of the individual and may prevent or postpone future organic disease.

Not to discuss the treatment of localized infection from colon bacilli, it may be stated that the treatment of intestinal putrefaction is, unfortunately, unsatisfactory. The prevention of constipation, withholding meat, including fish and poultry, from the diet, the administration of lactic acid bacilli as such or as soured milk, or the administration of yeast, and the cure of any gastro-intestinal inflammation that may be present by proper dietary, medicinal or surgical treatment, may prove very successful for some years in staying or preventing intestinal putrefaction. Although later to be discussed, it may be here urged that healthy teeth and gums are essential factors in the cure of intestinal fermentation.

SLEEP

This is a necessary and not sufficiently discussed part of our daily life. About one-third of each day of an adult's life should be spent in restful, natural sleep. Some individuals require more than others, but eight hours is the average requirement. Loss of consciousness, not syncope, not coma, not stupefaction by drugs, constitutes normal sleep. People who are not mentally alert, who are heavy and stupid or who are mentally insufficient sleep easily. This is true of cretins, of those of low mentality, of the absolutely illiterate (those who have little to think about), and of the very obese (in these cases drowsiness may be due to the amount of blood needed and circulated in the fat). Individuals who are anemic are likely to be sleepy and require more sleep. Children, young children especially, require much more sleep than adults, as their active brains become more readily fatigued.

The conditions favoring normal sleep are probably (1) fatigue products circulating in the brain or causing vasodilatation of the abdominal and peripheral circulation; (2) anemia of the brain more or less relative to that during consciousness, and (3) dimin-

ished cerebral reflex stimulation from external stimuli due to the dulling influence of fatigue products on reflex cerebral or spinal irritability, or it may be that such products circulating in the blood dull the senses and the peripheral sense nerves, or both.

During sleep the pulse is slowed and the brain contains less blood, while the other organs of the body contain more blood. The blood-pressure is lowered. The eliminative glands are more active, notably the sweat glands and the kidneys, but the secreting glands are diminished in activity. During sleep cellular repair takes place, final products of metabolism are formed and excretion is promoted.

Normal sleep cannot be produced by hypnotic drugs, although unconsciousness may be caused and the patient made to sleep. Under the action of hypnotics one or many organs do not functionate and cannot normally act, and the resultant sleep is inferior to natural sleep. Perhaps the most normal hypnotic is that which causes sleep by lowering the blood-pressure and causing anemia of the brain.

High blood-pressure, hysteria, etc., are causes of sleeplessness, and in these and many other conditions sleep must be brought about by physical methods, if possible; or it may be necessary to have recourse to drugs. Absolute insomnia is dangerous and must be stopped, but the continued use of hypnotic drugs invites only disaster, though the temporary use of such drugs may soon promote normal sleep and may actually save life. In fact, not enough thought is given by physicians to the amount of sleep that their patients obtain. Regulation of the sleep should be aimed at by every physician in every case requiring his care.

On the other hand, too much sleep is disastrous; the individual's brain becomes sluggish and incompetent, overpassive congestion of the abdominal organs takes place, sluggish metabolism occurs, constipation, kidney disturbances and a weakened circulation are the results. Patients who complain of being, or whom questioning shows to be, abnormally sleepy are pathologic and need medical advice. Overeating, alcohol, cerebral plethora, obesity, failing circulation and sub-thyroid secretion may all be causes of sleepiness. The cause being discovered, the treatment is self-evident.

Among the most frequent causes of insomnia are peripheral irritations, mental anxiety and hyperthyroid secretion.

WATER

The amount of water that should be taken is important, and quite generally is neglected by physicians in treating their patients. It is not a physiologic crime or a sign of a beginning pathologic condition to arise once at night to urinate (insurance examination blanks to the contrary notwithstanding), in cases in which the patient drinks a glass or two of water before retiring, which is not an infrequent habit. If the emunctories are to properly work during sleep, water is needed, and it should not be withheld. There is no intention in the above to minimize the importance of the symptom of arising several times at night to urinate as an indication of high blood-pressure and kidney, bladder or nervous irritability.

Water in plenty is an essential part of the diet at all times, and especially should goodly amounts of it be ordered in most conditions that require medical treatment. It is absurd to allow the "water cures" to do all of the ordering of this simple sanitary flushing commodity.

Before all operations, if there is time (that is, if it is not an emergency case), large amounts of water as well as plenty of starchy (carbohydrate) food should be given. After an operation the giving of a colon injection of from one pint to one quart of physiologic saline solution is good practice, and if the patient after operation receives such injection he will have less toxemia, less vomiting, better acting skin and kidneys, less headache and more sleep.

On the other hand, let us decry the thoughtless ordering of large amounts of water, or lithiated or other fool water, for patients who may be gouty and have defective kidneys, but who also have impaired circulation. An albuminuria from heart or kidney defect rarely calls for large amounts of water. Excessive amounts will weaken the circulation and cause congestion of the kidneys and dropsies.

The best time for taking extra water, that is, besides the normal goodly amount with meals, is three hours after eating. A considerable amount of water taken with a meal does not diminish or slow digestion; neither does a large amount of water taken between meals diminish the hydrochloric acid of the stomach. Hence water increases and does not inhibit gastric efficiency, and it promotes intestinal health. In cases of gastropnoia or gastric dilatation, large amounts of water may increase distress by overburdening the stomach, which does not readily empty itself.

(To be continued)

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

HEPCO FLOUR.—Hepco flour is a flour prepared from the Soya bean and has approximately the following composition: protein 42.9; carbohydrate 22.4, of which less than one-half readily yields sugar; fat 20.8; ash 5.1; fiber 4.2; water 4.6.

Actions and Uses.—It is claimed that clinical trials have shown that the carbohydrates in hepco flour are, in the main, not sugar producing and that therefore hepco flour is a suitable food material in cases in which carbohydrates are contra-indicated, as diabetes, amylaceous dyspepsia, etc. It has also been suggested for use in the diet in obesity. The nutritive value of 500 gm. of this flour corresponds to approximately 820 calories due to protein and 900 calories due to fat.

Manufactured by the Waukesha Health Products Company, Waukesha, Wis. No U. S. patent. U. S. trademark applied for.

Hepco Dodgers.—Hepco dodgers is a biscuit prepared from and having approximately the same composition as hepco flour.

Hepco Grits.—Hepco grits is a granulated "breakfast food" made from and having approximately the same composition as hepco flour.

To prepare hepco flour, Soya beans are cleaned and cooked with a little salt, then dried and ground. The flour is sifted and reground. Hepco dodgers are made according to the following recipe: 1½ pounds hepco flour; ½ teaspoonful of salt; mix well and add ¾ cupful of milk and 1 cupful of cold water; 2 eggs which have been thoroughly beaten; beat the whole mixture together into a cooky batter, roll out to ¼ inch thickness, cut with a cooky cutter and bake on well-buttered tins in hot oven. This recipe will make about three dozen dodgers. The dodgers are made up for shipping purposes by having a pure gelatine mixed in with the flour and then rolled out.

Hepco grits made according to the recipe for hepco dodgers. The material is roughly dried out and put through a bread crumber.

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SATURDAY, SEPTEMBER 26, 1914

THE ETIOLOGY OF PELLAGRA

Recently¹ we discussed the theory put forward by Alessandrini and Scala that drinking-water, because of the presence of silica in colloidal solution, was of consequence in the causation of pellagra. This theory is a novel one in that the relation of silica to the disease had not previously been advanced.

Although pellagra has been known and studied for nearly two centuries, not only is its essential cause unknown, but the broad question whether it is to be classed as a dietary or a communicable (contagious or infectious) disease has never been definitely determined. The spoiled-maize theory has for many years been the favored theory abroad, but its correctness has, for various reasons, been questioned by many. In this country there has arisen, both in the lay and in the medical mind, the opinion that pellagra is to be classed among the infectious diseases. This view has received important support, first, from the Illinois Pellagra Commission² and, more recently, from the Thompson-McFadden Commission³ (Siler, Garrison, and MacNeal).

In a recent issue of the United States *Public Health Reports*, Goldberger⁴ gives a summary of certain work now being done by the United States Public Health Service on the study of pellagra, and advances some most suggestive facts which do not in any way support the infection theory, but strongly point to the belief that pellagra is a disease essentially of dietary origin; that it is brought about in some such way as, for example, by the absence from the diet of essential "vitamins," or possibly, as is suggested by the work of Myers and Voegtlin,⁵ on the presence in vegetable foods of excessive amounts of a substance such as soluble aluminum salts. Goldberger states that a

large series of monkey inoculations were begun a year ago by Lavinder, Francis and Lorenz at the Marine Hospital in Savannah and that, although over one hundred animals were inoculated in every conceivable way and with practically every tissue, secretion and excretion from patients in a number of grave and fatal cases, the results up to the present have been negative.

A study by Willets of the records of the Georgia State Sanitarium showed that of 996 patients admitted during 1910, excluding those who died, were discharged during their first year, or had pellagra on admission or within a year of admission, there remained at the institution after one year, 418. Of this number, 32 or 7.65 per cent. have developed pellagra since that time. Of the present employees at the asylum, 293 have been in more or less intimate association with pellagrins and have lived in substantially the same or in identical environment for at least one year. Had pellagra developed among these employees at the same rate as it did among the inmates, 22 of them should have developed the disease. As a matter of fact, not one has done so.

The studies at the orphanage at Jackson by Waring show that on July 1, 1914, of 211 inmates, 68 or 32 per cent. had pellagra. A study of the distribution of these cases with respect to age brought out the remarkable fact that practically all the cases were in children between the ages of 6 and 12 years, of whom over 52 per cent. were affected. In the group of 25 children under 6 years of age there were 2 cases and in the group of 66 children over 12 years old there was but one case. The author states that inasmuch as all the children live under identical conditions as to environment, the remarkable exemption of the group of children under 6 and over 12 years of age is no more understandable on the basis of an infection than is the absolute immunity of the employees at the Georgia State Sanitarium.

A searching inquiry was made at both institutions covering all conceivable factors that might possibly explain the striking exemption of the groups referred to and the only constant difference discovered related exclusively to diet. It was found that at both institutions those of the exempt groups were found to subsist on a better diet than those of the affected groups. In the diet of those developing pellagra there was noted a disproportionately small amount of meat or other animal protein food; and the vegetable component, in which corn and syrup were prominent and the legumes relatively inconspicuous elements, formed a disproportionately large part of the ration. Other than this gross defect, no fault in the diet was appreciable and the author believes that the evidence clearly points to it as the cause of the pellagra at the two institutions.

In this connection it is of interest to note that the Illinois Pellagra Commission² in their report state that the total population of the Peoria State Hospital dur-

1. Pellagra and Potable Waters, editorial, THE JOURNAL A. M. A., Sept. 5, 1914, p. 868.
2. Pellagra in Illinois, Condensed Report of the Illinois Pellagra Commission, Arch. Int. Med., August, 1912, p. 123, and September, 1912, p. 219.
3. Siler, J. F.; Garrison, P. E., and MacNeal, W. J.: Pellagra. A Summary of the First Progress Report of the Thompson-McFadden Pellagra Commission, THE JOURNAL A. M. A., Jan. 3, 1914, p. 8.
4. Goldberger: United States Pub. Health Rep., Sept. 12, 1914.
5. Myers, C. N., and Voegtlin, Carl: Soluble Aluminum Compounds. Their Occurrence in Certain Vegetable Products, Pub. Health Rep., June 19, 1914, p. 1625.

ing the epidemic of 1909 was about 2,100 and of these there were at least 8.4 per cent. with pellagra. Yet during that period none of the employees suffered from the disease, in spite of the fact that they were exposed fully as much to the bites of insects and drew their food and water-supplies from exactly the same sources as the patients. "This freedom from pellagra on the part of the physicians, nurses, attendants and other employees has been absolute in all of the institutions." That Commission found that most of the patients with pellagra belonged to the chronic insane composed of "the defectives, senile demented, epileptics and the terminal stages of dementia praecox."

Goldberger believes that the deteriorated mental condition, causing apathy and indifference, results in an eccentricity in the diet and that this, in conjunction with a diet admittedly low in animal protein components, explains the excessive prevalence of the disease at the Peoria institution, a hospital almost all of whose inmates in 1909 were of the hopeless, incurable class drawn from the other Illinois institutions.

THE DISTRIBUTION OF UREA IN THE BODY

It requires no argument to establish the importance which urea has in the chemistry of the living body. Any substance which is formed in the organism to the extent of 30 gm. or more a day, and which is ordinarily excreted with extreme promptness, deserves consideration as a product which needs to be handled appropriately by the normally functioning individual and as a possible factor of danger in disease. Despite the abundance of information regarding the occurrence of urea and its antecedents in the body, it is surprising that so little quantitative information has been available with respect to its distribution in the blood and tissues. The explanation for the paucity of data of this sort is doubtless to be found in the lack of easily applied methods of analytic study applicable to this nitrogenous excretory product. The introduction of the urease method¹ of measuring the content of urea has furnished a peculiarly suitable procedure for ascertaining something further about the distribution of urea under various conditions of health and disease. By the use of this method in the laboratories of the Johns Hopkins Medical School Drs. Marshall and Davis² have secured valuable statistics in this field.

Hitherto there has been a widespread belief that the genesis of urea is restricted to special organs, among which the liver has been assumed to exercise a dominant rôle. That other parts of the body are not without significance in urea formation could no longer be denied when it was found that this substance continued to be excreted in not inconsiderable quantities after

more or less complete exclusion of the liver in experimental animals. In such cases the muscles have been assumed to play a dominating part. The newest investigations, on the other hand, have proved more conclusively than ever that urea occurs in all of the organs and tissues of the body. More significant than this wide-spread distribution, however, is the fact that it occurs throughout the body in approximately uniform concentration. This is true both in normal conditions and in cases in which, owing to such interference with excretion, an abnormally large amount of urea is present. An exception to the rule is found in the case of fat. This fact, however, is not surprising in view of the well-known slight solubility of urea in fats and the added fact that only relatively small amounts of water are present in adipose tissue. The somewhat higher content of urea found in the kidneys and other parts of the urinary tract is readily understood as the result of the unavoidable contamination of these organs with urine.

The approximately uniform distribution of urea throughout the body is also found when the urea content has been increased either by injections of urea or by interference with excretion by the kidneys, or by both means. The body cells appear to be able to take up surprisingly large quantities of the substance. The diffusion of urea to all parts of the body is accomplished very quickly. For example, no matter how soon blood is withdrawn after the end of an injection of urea a large part of this nitrogenous material has already gone out of the circulation. In view of this fact it is not difficult to understand why the concentration in the blood is never essentially higher or lower than that in the tissues themselves. Furthermore, urea is eliminated with extreme rapidity by the kidneys. The rate of excretion in normal animals is directly proportional to the concentration of urea in the blood. It may be retarded, however, after a certain amount of dehydration has occurred, that is, when elimination cannot be accomplished owing to lack of water for the kidneys to secrete. If water is then given, urea is again thrown out at an increased rate. There are doubtless few, if any, substances with which the body cells come in contact that permeate all kinds of cells so readily and that are eliminated so easily as is urea. As Marshall and Davis have pointed out, it is clearly the most desirable form into which nitrogen could be put for elimination from the body.

When the excretion of urea is prevented, either experimentally or by disease in the case of nephritics, the entire amount formed is stored in the body with the exception of small amounts secreted in the bile, sweat, etc. Here, again, its distribution is very general and uniform. No evidence whatever has been obtained of the possible transformation of urea into other substances in the body. This fact, taken in connection with the ease with which urea is distributed, excreted, or stored up as the case may be, is not without signifi-

1. Marshall, Jr., E. K.: A Rapid Clinical Method for the Estimation of Urea in Urine, *Jour. Biol. Chem.*, 1913, xiv, 283; A New Method for the Determination of Urea in Blood, *ibid.*, xv, 487.
2. Marshall, Jr., E. K., and Davis, D. M.: Urea: Its Distribution in and Elimination from the Body, *Jour. Biol. Chem.*, 1914, xviii, 53.

cance in relation to the symptoms observed in uremia. The chemical and physiologic properties of urea are such that it ought to be a non-toxic substance and the newer experiments show it to be non-toxic in any moderate or fairly large amounts. Only when introduced in enormous doses so that it approaches a concentration of 1 per cent. of the tissues in general does it produce a fatal effect. For this reason the Baltimore investigators conclude that it is improbable that urea is the only toxic agent in uremia, as has been supposed by some writers, although it may take some share in producing the symptoms of this condition.

The foregoing observations illustrate how greatly our knowledge of the chemistry of the organism is advanced when quantitative methods can be brought to bear on its problems. For additional illustrations one need only refer to the great advances which have been made in recent months in following the distribution of other so-called catabolites, such as creatin, creatinin, uric acid, and the amino-acids, in the blood and tissues. Indeed, blood and tissue analyses have emerged into new prominence in the laboratory. It is surprising to realize that until this period, the extent to which urea may be stored in the tissues has never been accurately determined. The newer researches have served to clear up many earlier conflicting and unsatisfactory data. They have demonstrated that retention of urea is a regular occurrence in certain cases of severe nephritis, and that the amount of urea in the blood does not account for the amount theoretically present in the organism. Finally, they have furnished evidence of an increase in the urea content of tissues in cases in which the blood urea is abnormally high. Contributions of this sort are certain to help clear up the pathology of conditions like uremia before long.

EARLY HUMAN REMAINS IN AMERICA

The determination of the age of the earliest human remains found on the American continent is of great interest. Until a few years ago North America was supposed to offer the most valuable evidence in this regard, though the Bureau of American Ethnology declared in 1907 that "no specimen had come to light in the northern continent which from the standpoint of physical anthropology represented other than relatively modern man." At that time some "apparently epoch-making discoveries" were reported from the Lagoa Santa Caves of Brazil, together with numerous finds of bones and cultural objects in Argentina. As a result the attention of the world was attracted to these places and there was a renewal of the story of Atlantis, the origin and descent of the human race being traced from very primitive anthropoid forms of South America. More recently interest has reverted to North America from the discovery of human remains in an asphalt deposit at Rancho La Brea in Southern California. A preliminary report on these

was read before the Museum of History, Science and Art of Los Angeles, June 11, 1914, by John C. Merriam.¹

The Bureau of American Ethnology was so much interested in the South American finds that two experts were sent to conduct an impartial investigation into the scientific significance of the discovered objects. Dr. Ales Hrdlicka went as the anthropologist and Mr. Bailey Willis of the United States Geological Survey as geologist. The material brought home from the various beds by the Hrdlicka-Willis expedition was submitted to the paleontologist of the United States Geological Survey and to the Geophysical Laboratory of the Carnegie Institution of Washington for an exhaustive investigation of their physical character and conditions of origin. Almost needless to say, the scientific criteria determined on were thorough and such as were calculated to the best possible degree to secure reliable results.

The conclusion was, "It seems quite evident that the human remains from the Lagoa Santa Caves cannot be accepted without further and more conclusive proofs as belonging to a race which lived contemporaneously with the extinct species of animals found in the same caves; and there is no reliable foundation for the remainder of the data relating to the specimens on which geologic antiquity can be based."

A similar unfavorable conclusion was reached regarding the antiquity of the skull taken from the harbor of Buenos Ayres. On this was based the theory of *Diprothomo platensis*, so called from the River Platte, in which the skull was found. The specimen had been taken from the oozy bed of the river when the workmen were excavating a rudder pit for the dry dock at Buenos Ayres. In geologic age, according to Professor Ameghino who wrote about it, it was a remnant from the Lower Pliocene and had originally belonged to a second or premediate precursor of man as part of his brainpan. He asserted that as to conformation it was older and less developed than the famous Neanderthal skull. Careful examination, however, showed that the facial angle is practically the same as in the average Indian. Dr. Hrdlicka says, "The Buenos Ayres skull fragment fails utterly to reveal any evidence which would justify its classification as a representative of a species of ancient primates, premediate forerunners of the human being, the *Diprothomo*. Every feature shows it to be a portion of the skull of man himself; it bears no evidence even of having belonged to an early or physically primitive man, but to a well-developed and physically modern-like individual."

Mr. Bailey Willis, the geologist of the North American expedition, after a careful investigation of the circumstances of the find and an examination of the character of the river bank, finds that he can give no

1. Merriam, John C.: Science, Aug. 7, 1914.

weight to the theory that "the unknown workman who found the skull and gave it to the foreman really dug it out of undisturbed ancient pampayan." The question of provenience is the crux of the whole matter of determining the age. It is this question also that has arisen with regard to the Rancho La Brea discoveries, that is, whether the materials existed originally in the associations in which they were subsequently found. In asphalt chimneys or tar pits such as are now being excavated at Rancho La Brea, materials may and indeed almost necessarily do move in the course of time, and their present associations do not necessarily determine their age. Objects of very different ages may have drifted together by gravity in the viscous material in which they lie buried.

The conclusion of the preliminary report, then, is that, while it is not possible to give a definite estimate of the age of the skeleton found, it belongs to a distinctly modern stage of evolution. It does not necessarily belong to the present historical period, but cannot be considered as having antedated it by many thousands of years. Merriam considers it well worth exhaustive scientific investigation, and the last word on the subject cannot be written until a great deal more study has been given the objects found. The associations are with specimens distinctly later in age than the typical Rancho La Brea fauna, which come from a very old geologic period. According to Dr. A. L. Kroeger, the racial characteristics do not differ decidedly from those of persons whose remains have been excavated in mounds on Santa Rosa Island off the coast of Southern California. While the question of antiquity is undecided, every evidence which we have would seem to point in North as well as South America to the comparatively recent origin or occurrence, geologically speaking, of man on our continent.

RESUSCITATION FROM MINE GASES

The Report of the Committee on Resuscitation from Mine Gases, appointed by the Council on Health and Public Instruction of the American Medical Association at the request of the Bureau of Mines of the Department of the Interior, has just been published by the Bureau.¹ This commission, which grew out of the work of the Joint Committee on Resuscitation from Electrical Shock, appointed by the Council from the Fellows of the American Medical Association, the National Electric Light Association and the American Institute of Electrical Engineers, consists of Dr. Walter B. Cannon, Chairman, Professor of Physiology, Harvard University; Dr. George W. Crile, Cleveland; Dr. Joseph Erlanger, Professor of Physiology, Washington University, St. Louis; Dr. Yandell

Henderson, Professor of Physiology, Yale University, and Dr. S. J. Meltzer of the Rockefeller Institute for Medical Research. This committee was requested by the director of the Bureau of Mines to carry on investigations for the development of an efficient method of resuscitation which may be administered by miners and other persons who have not had medical training, but who frequently have the opportunity to treat fellow workmen overcome by mine gases in places, generally in mines, that a physician or surgeon cannot reach in time to save life.

The committee reports that it has visited mines in the bituminous and anthracite coal regions of Pennsylvania, has met and talked with men of wide practical experience, witnessed demonstrations of artificial respiration by different methods and examined them critically, studied all the available mechanical devices for maintaining breathing and carried on a considerable amount of experimental investigation into the best methods of resuscitation following the inspiration of mine gases.

The report reviews the physiology and pathology of carbon monoxid poisoning, discusses the Sylvester and Schäfer methods of artificial respiration and, following the course laid out in the previous report on resuscitation from electrical shock, strongly recommends the Schäfer method on account of greater simplicity and ease of performance, absence of trouble from the tongue blocking the air passage, lessened danger of injuring the liver or breaking the ribs and larger ventilation of the lungs. The first three of these advantages were apparent. On the fourth point, larger ventilation, the commission instituted a series of experiments both on men and animals which convinced the committee that the prone pressure method of Schäfer is the most effective means of artificial respiration. Regarding the mechanical devices, four machines are now on the market, the Draeger pulmotor, the Dr. Brat apparatus, the lung motor and the Salvator. The pulmotor and the Dr. Brat apparatus were investigated and tested by the committee and were disapproved. It was found that "repeated suction of air from the lungs is not physiologic and if continued, is apt to result in injury to the lungs and inadequate inflation." In connection with the experiments of the commission on mechanical appliances, Dr. Meltzer has devised an apparatus which is easily and quickly applied and which the committee recommends on account of its certain action, the freedom from suction in expiration, and its lightness, cheapness and simplicity. A description of the apparatus and directions for its construction are contained in the pamphlet. This apparatus has already been described by Dr. Meltzer in *THE JOURNAL*.²

Summing up its experience and findings, the committee recommends artificial respiration in all cases of

1. The report is designated Technical Paper No. 77, and can be obtained by sending 5 cents to the Superintendent of Documents, Government Printing Office, Washington, D. C. It should be obtained by all interested in this subject.

2. Meltzer, S. J.: Simple Devices for Effective Artificial Respiration in Emergencies, *THE JOURNAL A. M. A.*, May 10, 1913, p. 1407.

gas poisoning and, as mechanical devices are seldom at hand, manual methods are recommended for first aid. Of these the prone pressure method is recommended unless the patient is suffering from some local wound which makes this impossible, in which case the Sylvester method may be substituted. In all cases of carbon monoxid poisoning, oxygen should be given instead of air. If the victim is still breathing spontaneously, oxygen may be given by fastening to the face a mask provided with outlet valve and an inlet valve, connected with a bag provided with oxygen from a cylinder. The Meltzer apparatus is recommended as the best of the mechanical devices available.

This report together with the report on resuscitation from electrical shock are notable and valuable contributions to our practical and scientific knowledge of the causes, conditions and treatment of these industrial accidents. The *Electrical World* at the time the report of the Committee on Resuscitation from Electrical Shock was published, reprinted this report in large quantities and distributed them with the accompanying chart, to electrical plants, power-houses and stations all over the country. They have been translated into a number of foreign languages and are recognized as standard and authoritative monographs on this subject. The report of the Committee on Resuscitation from Mine Gases is equally valuable and worthy of a similar wide-spread distribution. The work done by the members of these two commissions is a credit to the medical profession and the Association which they represent.

WORK FOR THE SAKE OF HEALTH

Extensive alterations in the social and industrial conditions of large groups of individuals almost always incidentally bring about changes in their hygienic situation. As a general rule, when the changes are in the direction of what we regard as social betterment the conditions of living are improved, sanitation is cultivated in greater measure, and the promotion and preservation of health follows as a natural consequence. A study of such movements reveals the advantages, from the point of view of both public and personal hygiene, that have followed the pure food crusades, the campaign against alcoholism, child-welfare innovations, investigations of institutional management, regulation of industrial conditions in respect to hours of work, factory inspection, etc.

There are, strange as it may seem at first thought, certain modern industrial changes which carry with them detrimental features that are not apparent on the surface. A growing group among whom the amount of muscular work done is small in comparison with the daily activities of their ancestors is coming into existence. We are not referring here to

the fact that shorter hours of work have everywhere become the custom—that the blacksmith who formerly toiled twelve hours now completes his working day in eight hours. The changes which we have in mind here are a consequence of altered methods of conducting business with the modern extension of commerce. Machinery has replaced muscle. The development of the industries by machinery has called for a different type of human working-power in which skill rather than strength is required. As a modern writer¹ has expressed it, the bodily qualities of the worker have been forced by the employer more and more into the background of valuation. Industrial factory work requires not so much strong men as persons who can perform with skill the many small tasks which the machines have so far not been able to perform. Hence the tendency to employ children, half-grown persons and women.

More significant than this is the fact that the number of those who do little manual labor has increased greatly. This is an era of office workers, of business and governmental officials whose implements are the desk chair, pen and pencil, rather than the hammer and the hoe. Even in agriculture machinery has eliminated some of the hardest types of manual labor. Muscular exercise, however, is a benefit rather than a detriment to the human economy. It improves the function of the essential organs of the body. Hence there has arisen an unexpected consequence, namely, the habit of trying to avert the possible harmfulness of some of these changed conditions by "balancing the lack of paid muscle work by work for hygienic reasons, by play and sport." The creation of work for the sake of health sounds almost paradoxical.

Current Comment

"LARGE" AND "SMALL" MEDICAL COLLEGES

The application to medical colleges of the terms "large" and "small" should and usually does depend on the size of the classes enrolled. With this understanding it can be stated that there are some small medical colleges which are admirably equipped and which are undoubtedly furnishing their students with an excellent scientific and practical medical training. In proportion to the numbers of students enrolled, some of these small colleges are among the best equipped institutions in the country, and some of them have been rated in Classes A+ and A by the Council on Medical Education. No one of these satisfactory small colleges, however, is "notoriously lacking in equipment" as implied in an editorial comment in one of our monthly exchanges. There are, indeed, several small medical colleges which are "notoriously lacking in equipment," but in no instance does such a

1. Rubner, M.: Address on the Nutrition of the People, delivered before the Fifteenth International Congress on Hygiene and Demography, at Washington, Sept. 24, 1912, and published in the Transactions.

school furnish a satisfactory training in medicine. At the other extreme, there are some medical colleges which have large enrolments of students, out of all proportion to the limited supply of expert teachers, laboratory equipment and clinical facilities. Because of these deficiencies or because of a too liberal administration of entrance standards, such schools do not and cannot furnish a satisfactory training. Some of these medical schools with large enrolments, for good reasons, are rated in Classes B and C by the Council on Medical Education. A reference to state board statistics, furthermore, shows that the graduates of some of these "large" medical schools do make poor records in the licensing examinations. It should not be said, however, that "as a rule the larger the college the higher is the percentage of its graduates who fail before the state examining boards" as stated in the editorial referred to. No such statement, meanwhile, is made in the State Board Number of *THE JOURNAL*,¹ to which the editorial refers, nor does any statement appear which would give such an impression. In the State Board Number it is stated that "the mere fact that a college has large classes is no indication that it furnishes a better medical training."² It is also true that "the larger the college . . . the more serious is inferior teaching."³ But these statements do not imply, nor should they be interpreted to mean, that in all colleges having large classes the teaching is inferior, or that all of them have large percentages of their graduates fail before state licensing boards. On the contrary, there are several colleges having large enrolments which at the same time have excellent supervision and, in proportion to their students, have an ample supply of expert teachers and an abundance of laboratory equipment and clinical facilities. Some of these large colleges, in fact, furnish an excellent medical training and their graduates make excellent records before state licensing boards. We would emphasize that a medical college should not be judged by the number of students enrolled but by the qualifications of its teachers; the possession of suitable and well-equipped laboratories; the abundance of clinical facilities available; the supervision exercised over the work and welfare of its students and—last but not least—the evidences of the skill and training of its graduates.

THE SIGNIFICANCE OF THE WORD LUTEIN

The word "lutein" has long been applied in physiologic chemistry to designate a group of fat-coloring matters which occur in nature and which have more recently often received the general designation of lipochromes. These yellow pigments are found in the adipose tissue, in the serum of the blood, in serous fluids, in fatty structures of the retina, in the egg-yolk, and in the corpora lutea. The use of the term "lutein" has been restricted as a rule to the yellow coloring-matter which develops in these ovarian structures, although one can find the word applied to derivatives of other physiologic tissues as synonymous

with lipochrome.⁴ Thus in a recent discussion respecting the appearance of a yellow pigment in cerebrospinal fluid in cases of tumor of the spinal cord the word "lutein" is employed to designate the color.² Hitherto the chemistry of this group of compounds has been very indefinite and they have been classified and identified by their solubilities and other physical properties. Now that the subject is receiving more serious study, however, and the precise nature and relationships of the lipochromes or luteins is being cleared up,³ it may soon be possible to speak accurately of carotin or xanthophyll or some other specific substance instead of applying the more indefinite group expressions referred to above. It therefore seems particularly unfortunate at this time to find the word "lutein" entering anew into the nomenclature of medicine in an entirely different sense. Lately various preparations of desiccated corpora lutea from animals are being sold under the designation of lutein.⁴ This new therapeutic product obviously represents something more than merely the yellow pigment of a part of the ovarian structure, for there is no evidence that the lipochrome itself is responsible for any physiologic effects. Evidently the word "lutein" has commended itself, without consideration of the historical import of the word, as a euphonious designation which would at once suggest the natural origin of the product. This is not an isolated instance of confusion of terms. The word "bromalin" has been devised by manufacturers for a synthetic bromin derivative despite the existence of the word "bromelin," the name of the proteolytic enzyme of the pineapple. Other instances might be cited. We trust that a reference to the matter here may help to avert further undesirable unnecessary complication of this sort on the part of those who are devising names for new products.

PUBLIC HEALTH IN INDIANA

Health administration in Indiana has for a long time past been vigorous and energetic, as it is in many of our other states. It has also been unique, peculiarly up-to-date and popular in its methods of attracting attention and affording instruction. The latest activity of the health forces of the state is thoroughly characteristic. Governor Ralston has issued a proclamation designating Friday, Oct. 2, 1914, as Disease Prevention Day. He urges the cities and towns throughout the state to make special arrangements for appropriate exercises, emphasizing the importance of public health, and the joint responsibility of all citizens therefor in order to inspire in them a desire to cooperate in all sane efforts for the prevention of physical diseases. The state board of health has prepared a special bulletin containing a copy of the governor's proclamation and suggestions for the celebration of Disease Prevention Day in the towns of Indi-

1. See, for example, Hammarsten-Mandel: *Text-Book of Physiological Chemistry*, 1911, p. 260.

2. Clarke and Lansdown: *Brit. Med. Jour.*, May 9, 1914. *Boyd: ibid.*, May 23, p. 1158.

3. *The Natural Yellow Pigments Occurring in the Body*, editorial, *THE JOURNAL A. M. A.*, Sept. 12, 1914, p. 948.

4. See *New and Nonofficial Remedies*, 1914, p. 183.

1. *THE JOURNAL A. M. A.*, May 23, 1914, p. 1639.

2. *Ibid.*, p. 1660.

3. *Ibid.*, p. 1655.

State Society to Meet.—The Minnesota State Medical Association will hold its annual meeting at the St. Paul Hotel, St. Paul, October 1 and 2, under the presidency of Dr. Alfred E. Spaulding, Luverne.

Urges County Health Organization.—Dr. H. W. Hill, executive secretary of the Minnesota Public Health Association, proposes the organization of a health association in each county of the state.—County health organizations have already been formed in Wilmar and Marshall counties.

Advance in Work against Tuberculosis.—The first annual report made by Dr. Robinson Bosworth, executive secretary of the advisory commission of Minnesota State Sanatorium, gives an interesting summary of the progress of the work of establishing county tuberculosis sanatoriums. Nopeming Sanatorium, St. Louis County, 14 miles from Duluth, is under operation with sixty patients; Ottetail County Sanatorium at Battle Lake, with sixty-five patients; Nopeming County Sanatorium has been enlarged by the addition of an infirmary of thirty-five beds, a heating plant and laundry, at an expense of \$75,000; Ramsey County Tuberculosis Pavilion is open this month with a capacity of 110 patients; Hennepin County is constructing a seventy-five bed institution at Glen Lake near Hopkins, which will be completed within a year at a cost of about \$100,000; Lincoln, Lyon, Pipestone, Murray, Cottonwood, Rock, Nobles and Jackson counties have organized a sanatorium district and are seeking a suitable location for the joint sanatorium on which about \$95,000 will be expended; Yellow Medicine, Chippeway and Renville counties have voted to build a joint sanatorium providing a fourth enters the group. Lac Qui Parle is the fourth county of this group; Wabasha County has requested the commission to choose its selected site; Douglas County has made a tax levy to build a sanatorium and is endeavoring to get Grant, Pope and Stevens counties to join with it; the county board of Blue Earth County is leaving the matter of a sanatorium to the wishes of the people at an election; Brown and Nicollet counties are ready to build a sanatorium, and Redwood and Watson counties wish to join this group; Goodhue County has accepted plans for a building to be erected on the Cannon Falls site; Pope and Norman counties have purchased a sanatorium site at Crookston; Clay and Becker counties have selected a location at Lake Park and have appointed an architect; Beltrami, Koochiching and Hubbard counties have voted their tax levies, appointed sanatorium commissions and will build at or near Bemidji; Marshall County, either alone or with Pennington County, will build a sanatorium; Wadena and Todd counties have made the necessary levy and are endeavoring to secure a third county for the group. The expenses of the advisory commission for the year were \$9,456.93, leaving a balance in hand of \$543.07.

MISSISSIPPI

Pellagra Not Admitted to Vicksburg.—The trustees of the Vicksburg Emergency Hospital have passed a resolution to accept no pellagra cases for treatment on the ground that the hospital has no facilities for the proper treatment of such cases. The railroads have been notified not to bring pellagra patients into Vicksburg, but protest that they have no means of diagnosing the disease.

Malaria in Washington County.—In response to the request made to the surgeon-general of the Public Health Service that antimalarial work be undertaken at Greenville and large plantations nearby, Surgeon Rudolph H. Von Ezdorf, Assistant Surgeon Robert C. Derivaux and Sanitary Engineer J. A. Lee Prince, U. S. P. H. S., have been detailed to make an investigation of the conditions contributing to the spread of malaria in that region.

New Society Organized.—The Homochitto Valley Medical Society was organized in Natchez, September 8. The districts include Adams, Amite, Franklin, Jefferson and Wilkinson counties, and the following officers were elected: president, Dr. Richard D. Sessions, Natchez; county vice-presidents, Adams County, Dr. Joseph D. Shields, Pine Ridge; Amite County, Dr. William R. Brumfield, Gloster; Franklin County, Dr. George T. Warren, Bude; Jefferson County, Dr. Leon R. Harrison, Fayette; and Wilkinson County, Dr. Columbus L. Field, Centerville; secretary-treasurer, Dr. Marcus Beckman, Natchez.

NEW JERSEY

New Officers.—Morris County Medical Society at Morris Planes, September 8: president, Dr. Frederick E. Knowles, Boonton; secretary, Dr. Henry W. Kice, Wharton.

Addition to Insane Hospital.—Plans have been adopted for an addition to the Overbrook Hospital for the Insane, Verona. The new building will have accommodations for 270 patients.

Measures against Anthrax and Glanders.—The State Board of Health, September 8, adopted regulations designed to prevent the importation of anthrax from Delaware, where cattle are said to be infected nearly every year.—The New Jersey State Health Department is securing from the Bureau of Animal Industry at Washington and forwarding to local boards of health throughout the state quantities of mallein to be used for the ophthalmic test on horses.

NEW YORK

Infantile Paralysis.—Cases of infantile paralysis are reported from Syracuse and Binghamton. The State Department of Health is taking every precaution to prevent the spread of the disease.

Personal.—Dr. Alexander Lowenstein has been placed in charge of the work of the Jewish Philanthropic Society recently organized at Rochester.—Dr. Harold H. Fox, Springville, has been appointed medical adviser of Cornell University and assumed charge of his new office at Ithaca, September 20.—Dr. Wardner D. Ayer, Rensselaer, has been appointed pathologist to the Crouse-Irving University, Syracuse.—Dr. and Mrs. Francis R. Benham, Syracuse, have returned from abroad.

New York City

Personal.—Dr. and Mrs. John J. Moorhead and Dr. and Mrs. George Draper have returned from Europe.—Dr. Michael J. Thornton, for four years in charge of the psychopathic ward of Bellevue Hospital, has been appointed chief of staff of the psychopathic ward of the Kings County Hospital, Brooklyn, succeeding the late Dr. William B. Moseley.

Typhoid Epidemic in Brooklyn.—Up to September 12 there have been fifty-three cases of typhoid fever reported from the Park Slope section of Brooklyn, but since that time no new cases have been reported. The source of the infection has not been determined, and though many specimens of water have been examined, there is no indication thus far that the trouble lies in the water-supply.

New Requirement for Peddler's License.—The Department of Health and the Department of Licenses have determined to extend the scope of the medical examination now made of applicants for peddler's licenses and to include in each instance a Wassermann test. The physical examinations will be made in the tuberculosis clinics at present. Licenses will be denied to tuberculous persons whose sputum shows the presence of the tubercle bacilli and to those whose blood gives a double plus Wassermann reaction.

NORTH CAROLINA

New Hospital.—The construction work on St. Luke's Hospital, Newbern, being built by Drs. R. Duval Jones and Joseph F. Patterson is progressing rapidly and it is expected that the hospital will be opened before the end of the year.

Trachoma Investigation.—Dr. A. D. Foster of the United States Public Health Service, in his trachoma investigation in this state, has visited seventy-one white and thirteen colored schools, examining over 12,000 pupils and finding about thirty-cases of trachoma. The heaviest infection (eighteen cases) was found among the 207 pupils examined at the Indian school at Cherokee, Swain County; but this was also the only place where measures had been taken to determine the presence of the disease and to control its spread. The heaviest infection among whites was in Caldwell County, lighter infections being found in Cherokee and Mitchell counties. Only one negro was found infected. Dr. Foster believes that foreign immigration has played little or no part in introducing the disease here.

State Board Prizes.—The State Board of Health has offered six prizes of \$25 each for the best articles on six health subjects written by citizens of the state. The subjects of the articles are, typhoid fever, malarial fever, diphtheria, scarlet fever, whooping-cough and measles. The prize essays will be published in the *Bulletin of the State Board of Health*. The contest is open to any citizen of North Carolina, who may compete for any or all of the prizes. The articles must be within one thousand to two thousand words, and the last day for filing the manuscripts for the competition will be, for typhoid fever, October 1; malarial fever, November 1; diphtheria, December 1; scarlet fever, Jan. 1, 1915; whooping-

cough, February 1, and measles, March 1. The judges of the competition will be the editor of the *Bulletin*, an editor of a city newspaper, a physician and a layman.

OHIO

New Hospital.—Plans have been completed for a new Jewish hospital, Cleveland, and construction is to begin October 15.

Protest Recognized.—The Logan County Medical Society, which protested its transference by the council of the State Medical Society to the Dayton district, has been retransferred to its old district, known as the northwestern district.

"Baby's Health Is Cleveland's Wealth."—This is the slogan adopted by the child hygienic committee of Cleveland for "Baby Sunday," September 13. Every minister was requested to use the baby campaign as a theme for his sermon on that day. Lectures and exhibitions were given at the City Hall on September 14, and department stores also gave special window demonstrations on that day.

Citizens' Hospital for Barberton.—A very successful campaign to raise money for a hospital has just been terminated in Barberton. The hospital is to have a capacity of fifty beds, and \$50,000 was raised. Over five thousand of the citizens own stock in the hospital, and it is to be known as the Citizens' Hospital Company. The hospital is to be self-supporting, and its equipment will be modern in every respect.

Small-Pox.—Small-pox continues to prevail in certain districts. The board of health of Sandusky is making a vigorous effort to rid that city of an outbreak which has lingered for some time. A meeting of all Sandusky physicians was called on September 9, and they were addressed by Dr. Frank G. Boudreau of the State Board of Health on the diagnosis and control of the present mild outbreak of small-pox. Dr. Boudreau afterward examined the Sandusky cases, of which there are three at the present time.

Director of Bureau of Juvenile Research Appointed.—Dr. Thomas H. Haines has been appointed chief psychologist of the new juvenile research bureau under the direction of the Ohio State Board of Administration. The position now occupied by Dr. Haines is an extremely important one, because of the large number of institutions under the care of the Ohio State Board of Administration. The new bureau will probably be located on the Ohio State University campus as a part of the proposed medical group.

Personal.—Dr. Charles H. Clark, superintendent of the Newburg State Hospital, Cleveland, has been appointed superintendent of the Lima State Hospital for the Criminal Insane. The new hospital is practically completed and will pass under the control of the State Board of Administration early in 1915.—Dr. Julius J. Buel, wife and daughter, Cleveland, have returned from abroad.—Dr. and Mrs. John J. R. MacLeod, will sail for home, September 19.—Dr. and Mrs. John Edwin Brown and son, Columbus, have returned from Europe.

District Health Officers for Ohio.—A bill to divide the state into health districts and to provide for whole-time, experienced district health officers, will be introduced at the next session of the general assembly. Each district will comprise one or more counties, and the county commissioners will act as a board of control. Only persons who have the degree of M.D., D.P.H., or some equivalent degree, will be eligible as candidates for the position of district health officers. All candidates will have to pass a civil service examination. The minimum salary is fixed at \$2,000. In addition to the duties now performed by health officers and boards of health, the district health officer will be required to provide for medical inspection of schoolchildren, the inspection of workshops, factories and a complete system of milk and dairy inspection. District health officers will have jurisdiction everywhere except in incorporated cities.

OREGON

State Association Meeting.—The annual meeting of the Oregon State Medical Association was held in Portland, September 10 and 11, and the following officers were elected: president, Dr. Alpha E. Rockey, Portland; vice-presidents, Drs. Robert J. Pilkington, Astoria; William H. Dale, Harrisburg, and Robert J. Marsh, Portland; secretary, Dr. Marius B. Marcellus, Portland (reelected); treasurer, Dr. Katherine C. Manion, Portland (reelected); councillors, Drs. Joseph A. Pettit and Calvin S. White, Portland, and Francis G. Swedenburg, Ashland; delegate to the American Medical Association, Dr. Walter T. Williamson, Portland, and alternate, Dr. Kenneth A. J. Mackenzie, Portland.

PENNSYLVANIA

Diphtheria Epidemic.—A rather serious epidemic of diphtheria at Keystone Mines is under investigation by the State Health Department.

Leprosy in Wilkes-Barre.—The health authorities of Wilkes-Barre have been advised that Joseph Norman of that city, who went to Philadelphia recently, is suffering from tubercular leprosy. The house in which this man lived has been placed under quarantine.

Diarrheal Epidemic in the Coal Regions.—An epidemic of acute diarrhea has been reported from Freeland, Jeddo, Upper Lehigh, Feltley, Drifton and surrounding towns. Dr. Charles J. Hunt of the State Health Department, sent to the Luzerne coal regions to investigate the epidemic, reports September 1 that 1,000 cases have been found. An investigation of the cause is under way.

Philadelphia

Leptous Rats.—Two rats infected with leprosy germs have been discovered by the Department of Health in its campaign to clean the river front. The first rat with traces of leprosy was brought to the receiving station at Race Street pier, three weeks ago. The second, caught September 17, was found in a building near the wharf.

Personal.—Dr. Harry Lowenburg has returned from abroad.—Dr. and Mrs. G. Oram Ring have returned from the Mediterranean.—Dr. Laura Hunt has been appointed Professor of Otology at the Women's Medical College, to fill the position left by the death of Dr. Emma Musson.

New Ward Equipped.—A new ward for men and another for children has been equipped at the College Hospital, according to an announcement made at the opening exercises of the Woman's Medical College. The children's ward has been equipped largely by private donations, through the efforts of Dr. Theodore LeBoutillier and others.

WISCONSIN

Home from Europe.—Drs. Albert A. Maurer, La Crosse, and Frederick A. Kraft, Milwaukee, have returned from abroad.

Bacteriologist Appointed.—Miss Anna Stolzenfeld, as the result of a civil service examination, has been made first assistant bacteriologist in the Municipal Laboratory, Milwaukee.

New Officers.—Second District Medical Association at Lake Geneva, Wis., September 1: president, Dr. Gustave Windesheim, Kenosha; secretary, Dr. Milton V. Dewire, Sharon (reelected).

GENERAL

Life Insurance Directors Meet.—The annual meeting of the Medical Section of the American Life Convention will be held in Dallas, Texas, October 7.

Military Surgeons to Meet.—The twenty-third annual meeting of the Association of Military Surgeons of the United States will be held in Cincinnati, September 29 to October 2, with headquarters at Hotel Gibson.

Railway Surgeons Hold Meeting.—The railway surgeons of the Dakota, and Pierre and Rapid City divisions of the Chicago and Northwestern System met in Huron, S. Dak., September 16, at the call of Dr. John L. Foxton, district surgeon of the Dakota division, to meet the new chief surgeon of the system, Dr. George W. Hopkins, Chicago, and organized an association which will hold meetings once or twice a year.

Electrotherapeutists Meet.—At the twenty-fourth annual meeting of the American Electrotherapeutic Association held in Battle Creek, September 15 to 17, the following officers were elected: president, Dr. John W. Torbett, Marlin, Tex.; vice-presidents, Drs. Abram B. Hirsh, Philadelphia; Curran Pope, Louisville, Ky.; William Martin, Atlantic City, N. J.; Alfred J. Hopkins, Pittsburgh, and John S. Yates, Paterson, N. J.; secretary, Dr. John W. Travell, New York City (reelected), and treasurer, Dr. Emil Heuel, New York City (reelected).

Tuberculosis Conference.—The second Mississippi Valley Conference on Tuberculosis will be held at the Planters Hotel, St. Louis, October 6 to 8, in cooperation with the making of the National Association for the Study and Prevention of Tuberculosis. The purpose of the conference is to bring about a closer relationship between antituberculosis agencies in the Mississippi valley; to provide for the interchange of ideas and experiences, and to strengthen and extend the work

of the National Association and to arouse the people to the need for concerted action, both public and private, against the common foe, tuberculosis, and to bring about a closer cooperation between antituberculosis societies and other health agencies.

American Association for Study and Prevention of Infant Mortality to Meet.—The fifth annual meeting of this association will be held in Boston, November 12-14. The program will include sessions arranged by the committees on nursing and social work, pediatrics, vital and social statistics, obstetrics and public school education. Among the subjects to be discussed are included prenatal care, the need for increased and improved maternity hospital service, institutional mortality and continuation schools of home-making. The sessions will meet at the Harvard Medical School and at the Copley Plaza Hotel. Special clinics and an exhibit will be held in connection with the meeting.

Bequests and Donations.—The following bequests and donations have recently been announced:

The Western Reserve University Medical School Cleveland; a bequest of nearly \$1,000,000, in memory of Albert Fairchild Holden, by the will of his father, Liberty E. Holden, Cleveland.

Massachusetts General Hospital, Boston, \$1,000 by the will of H. R. Dalton.

Vincent Hospital, Boston, \$3,000 by the will of J. B. F. Thomas, Boston.

Mt. Sinai Hospital, \$2,000, and Hebrew Orphan Asylum, New York City, \$1,000, by the will of Arthur Klein.

Brooklyn Bureau of Charities, German, Bushwick and Swedish Hospitals, each bequests varying from \$900 to \$1,800 by the will of Jacob W. Erregger.

American Theatrical Hospital, Chicago, donation of \$5,000 by Jack Wilson to provide and equip an operating amphitheater, to be known as the Ada Lane Wilson Memorial.

Public Health in Porto Rico.—The chief of the public health service in Porto Rico, Dr. W. F. Lippitt, states that the mortality last year for the island was only 18.6 per thousand, a saving of 5,832 lives annually since 1911, when the service was organized. He declares that the change in conditions in regard to public health in such a brief period has never been surpassed and has scarcely been equaled in any country. The prompt way in which bubonic plague was stamped out when it got a foothold in the island in 1912 was the envy of other countries, especially as the effect was realized by the intelligent and energetic cooperation of the people. Dr. Lippitt has also recently sent a circular letter to all the members of the public health service saying that the sanitation service is not only for the purpose of keeping the streets clean, etc., but that it should take up all kinds of work bearing in any way on the public health, and consequently he urges each member to make a special study of some matter affecting the public health in his community, and offers the facilities of the laboratories for research or any other aid that may be required. He leaves each one free to select his own subject. The report when completed will be published in the official bulletin, credited to the author.

Plague in New Orleans.—Since the last report of bubonic plague published in THE JOURNAL of September 12, no cases of human plague have been discovered, but twenty-eight cases of rodent plague have been found, Nos. 86 to 114, inclusive, up to September 17. During the fortnight ended September 12, the Department of Outgoing Quarantine has fumigated 141 vessels with sulphur and 28 with carbon monoxid; has burned 25,116 pounds of sulphur; has consumed in carbon monoxid fumigation 32,890 pounds of coke; has inspected 40,017 tons of outgoing freight and 202,986 packages of freight; issued 81 clean and 8 foul bills of health. The Department of Overland Freight Inspection has inspected 6,573 cars; has rat-proofed 3,445 cars and has condemned 20 cars. No rodents were killed in cars during the fortnight. The Department of Field Operations has trapped 15,480 rats; has fumigated 7 premises; disinfected 145 premises; inspected 10,327 premises; has placed 515,715 poisons; has served 4,978 notices; has rat-proofed 560 buildings and has inspected 248 dead. The Department of Laboratory Examinations received 14,017 rodents, of which it has examined 9,996; 25 suspicious rats were found, and in 14 of these the diagnosis of plague was confirmed; 1 suspicious case of human plague was examined. The total number of rodents found up to September 12 was 79,543, of which 68,595 were examined.

CANADA

Health Officers of Nova Scotia.—At the recent meeting of the Medical Officers of Health of Nova Scotia, Dr. William H. Hattie, Dartmouth, provincial officer of health, presided. Among those who delivered addresses were Dr. Peter H. Bryce, Ottawa, and Dr. John W. S. McCullough, Toronto. Annual meetings will be held in the future.

Ontario Medical Association.—The next meeting of the Ontario Medical Association will be held in Peterborough in May, 1915. This meeting will be held in connection with the annual meeting of the Health Officers of Ontario. Dr. Thomas W. H. Young, Peterborough, is chairman of the Committee of Arrangements.

Personal.—Dr. W. E. Deeks has abandoned his trip to England, and is at present examining recruits in Montreal. —Dr. Campbell B. Keenan, Montreal, has accepted the position of regimental surgeon to the Princess Patricia's Light Infantry. Dr. Keenan served through the South African war as surgeon to Strathcona's Horse. —Sir Thomas Roddick has returned to Montreal. At the outbreak of the war he was in Alsace, but reached London after a very trying journey. On his return to Montreal he contracted a cold which developed into pneumonia, from which he is now said to be recovering. —Dr. Robert Rudolf, Toronto, has gone to England, where he has been called to act as medical adviser to one of the base hospitals. —Hon. Dr. Beland, who has been doing good service in a medical capacity for the Belgians, has been appointed by the Dominion government to attach himself to Canada's first contingent. —Dr. George W. Ross, Toronto, has returned from Europe.

WAR NOTES

Madras Gives Hospital.—The government of Madras has offered a fully-equipped hospital ship with a capacity of 300 beds for the use of the Indian expeditionary force.

Red Cross Hospital Opened.—Two Washington physicians, Dr. Franz A. R. Jung and his wife, Dr. Sofie Nordhoff Jung, have established an American Red Cross Hospital in Munich, with a capacity of sixty beds.

Rations of War Prisoners in England.—The British War Office has stated the following as daily rations for war prisoners: bread, 1½ pounds or biscuits, 1 pound; fresh or frozen meat, 8 ounces or preserved meat, half ration; fresh vegetables, 8 ounces; butter or margarine, 1 ounce; condensed milk, one-twentieth of 1 pound tin; tea, one-twelfth ounce, or coffee, 1 ounce; sugar, 2 ounces; salt, one-half ounce.

Canadian Physicians Off for the Front.—It is probable that Lieut.-Col. Adam T. Shillington, Ottawa, will sail with the Canadian detachment, in charge of the Base Hospital, and with him will go Lieut.-Col. Robert L. Gardner and Drs. William P. Dillon, Charles A. Young, Neil McLeod, George Howlett Bell, Charles E. Preston, Theodore A. Lomer and James Seagar, all of Ottawa. —Dr. Edward J. Williams, Sherbrooke, Que., at present in command of the Sixth Cavalry Field Ambulance, has been appointed to duty in a stationary hospital in France.

Dr. Almroth E. Wright Recommends Antityphoid Vaccination.—In a letter to the London Times, Dr. Almroth E. Wright adds his influence to the movement for antityphoid vaccination for British troops. He suggests as the author of the method that it be made compulsory. Within the last three weeks he states a total of 180,000 doses of "antisepsis" vaccine have been supplied to the British army and navy and to the French military hospitals. Besides, the Department for Therapeutic Inoculation of St. Mary's Hospital, of which Dr. Wright is the head, has furnished as a contribution for the use of the British army nearly 280,000 doses of antityphoid vaccine.

Medical Congresses Postponed.—The following item is taken from *Deutsche medizinische Wochenschrift*, Aug. 13, 1914: "We have received from Professor Oppenheim the information that the Society of German Neurologists will omit the session of their society for this year. We may assume the same for all the other medical congresses, especially the Science Association (Naturforscherversammlung). Regarding the International Medical Congress which is planned for 1917, it is said that the German Executive Committee has already announced that further preparations for this meeting are discontinued. However, . . . it may be assumed with complete certainty that in 1917 the feeling of mutual embitterment will not yet have disappeared to a sufficient extent to permit a meeting of the representatives of those nations who are now threatening each other with destruction to take place and the usual speeches of greeting on the nation-binding power of science to be made in quiet."

Shortage of Medical Men in England.—The Medical Press and Circular, September 9, says that war has already absorbed a large proportion of what may be termed the floating section of the medical profession—that is to say, those of its members who are not engaged in private medical practice or in

one of the public services. Many newly qualified men are residents in hospitals, where they gain a valuable insight into professional work. Others of various ages act as assistants or do locum tenens work. Naturally many of this class have joined the army as surgeons on the comparatively liberal terms offered for service during the war—namely, 24 shillings a day, with allowances, and £60 grant at the end of the term of service. In addition not a few practitioners have thrown up their work and gone to the front. A large number of hospital surgeons have followed their example, with the result of a serious dislocation of medical practice throughout the Kingdom. Before the war there was a shortage of medical men, a deficiency that has now been seriously aggravated. Many asylums, poor law infirmities and voluntary institutions are at their wits' end to find resident medical officers to carry out their routine work.

LONDON LETTER

London, Sept. 9, 1914.

The War

As stated in my last letter, ample preparations have been made for the reception of the wounded in the various civil hospitals throughout the country and also in military hospitals, of which many are being established. At the London Hospital as many as 500 beds—250 for the army and 250 for the navy—have been offered and have been accepted. Three hundred wounded soldiers have arrived. They were taken from the railway station by a large party consisting of resident medical officers who acted as stretcher bearers and carriers. In consequence of the enormous crowds which gathered they were admitted by a back gate. Contrary to the rule of the hospital, they have been allowed to smoke in the wards, a privilege which they greatly appreciate. At Netley there is a great military hospital and military medical school. Here 800 soldiers from the front have been admitted. Some of them are sick, some suffering from sore feet and several hundreds from gunshot wounds. Hardly any of the wounds have been caused by rifle fire; most of them are due to shrapnel bullets. This is contrary to previous experience which is that wounds from rifle bullets are the commonest.

Inquiries of the government into the question of the drug supply have shown that, while in the case of many drugs, the prices of which have risen considerably, such shortage of stocks as exists is due to temporary and easily removable causes, in other cases a considerable period may have to elapse before the small supplies at present available in the country can be replaced. In the case of some drugs, as for example, the bromids, the shortage is due to the fact that the mineral deposits from which they are at present obtained are found chiefly in Germany, while in other cases, such as that of many synthetic remedies, the manufacture is largely carried on in that country. In other cases, again, the existing shortage is due only to the general interruption of sea-borne trade which accompanied the outbreak of war, and will be relieved as shipping communications are restored. The government has appointed a committee consisting of prominent physicians to consider questions arising in connection with the supply of drugs with special reference to the ways in which the medical profession can assist in effecting economies in the use of those drugs of which the supplies are small. A confidential circular has been issued by this committee to all physicians asking them as far as possible to conserve the stock by restricting the use of drugs of which the supplies are very small and not easily renewed. These drugs have been divided into two classes: those of which the stocks are very low and possibly cannot be replenished for a considerable time, and those which, though showing some shortage at present, can soon be replenished from ordinary sources or by opening alternative sources in a short time. The first group includes salicylates, bromids, potassium salts, glycerophosphates, liquid petrolatum, synthetic benzoic acid and its salts. It is suggested that salicylates should be reserved for the treatment of acute rheumatism and that for other diseases (influenza, neuralgia and conditions loosely termed rheumatic) other drugs be used. It is suggested that bromids be used only for epileptics, that sodium bicarbonate be substituted for potash salts, and sodium sulphate and phosphate for potassium tartrate and potassium sulphate; that for mouth washes and antiseptic gargles other substances than potassium chlorate be used; that syrupus ferri phosphatis and syrupus calcii lactophosphatis be substituted for glycerophosphates; that other laxatives be used instead of liquid petrolatum, and that benzoic acid be used only when

a satisfactory substitute cannot be obtained. The second class consists of citric acid and tartaric acid, synthetic products (antipyrin, acetanilid, phenacetin, etc.), ergot, formaldehyd and its derivatives, hexamethylenamin and allied compounds and gentian root. It is suggested that instead of prescribing quinin in effervescent mixtures, acids be ordered, thus avoiding the use of citric and tartaric acid. With regard to the synthetics and analgesics it is suggested that their loss would be felt less if they were not used as antipyretics; that ergot be reserved for the treatment of post-partum hemorrhage, that formaldehyd be reserved for cases in which other disinfectants are inapplicable; that boric acid be used as a urinary anti septic instead of hexamethylenamin and its allies, and that other bitters be used instead of gentian. The question of manufacturing some of the drugs hitherto obtainable solely from Germany is being seriously considered by manufacturers.

The protection of troops in the field against typhoid fever is receiving consideration. Army medical officers in charge of home depots, garrisons and camps are strongly urged to use all their influence in securing as many volunteers as possible for inoculation against typhoid fever. Sir William Osler has written to the *Times* in support of this. He thinks it would be very difficult to prevent outbreaks of dysentery and typhoid fever, of which in the South African War more died than were killed in action. He urges that antityphoid vaccination be made compulsory in the army.

Marriages

MARY VIRGINIA McCUNE, M.D., Martinsburg, W. Va., to L. KISMET ROSSA, M.D., of Melbourne, Australia, at Harper's Ferry, W. Va., September 7.

FREDERICK B. CLARKE, M.D., Milwaukee, Wis., to Miss Agnes Myrle McCormick at Buffalo Ranch near Billings, Mont., August 31.

JOHN GRANT HARTWELL, M.D., Boston, to Miss Marion R. Gile of Colorado Springs, at her summer home in MacMahan, Me., September 2.

ROBERT BUCHANAN KENNEDY, M.D., New York City, to Miss Anna May Reimer of Rockland Lake, N. Y., September 5.

DANA FRANK CUMMINGS, M.D., Cherryfield, Me., to Mrs. Blanche Cyrene Ross Ray of Rockland, Mass., September 1.

BENJAMIN ALISON COCKRELL, M.D., Pineville, Ky., to Miss Harriet Tilghman Marimon of Valparaiso, Ind., September 2.

AUGUST HENRY ROSEBURG, M.D., Denison, Ia., to Miss Alexandria Zorin of San Diego, Cal., at Omaha, September 7.

CHARLES EDWARD PALMER, M.D., David City, Neb., to Miss Narcissa Houston Light of Cozad, Neb., September 1.

EDWARD EMMET POWERS, M.D., Rome, N. Y., to Miss Mary Catherine Reding of Dunkirk, N. Y., September 9.

ABRAHAM WILLIAM NELSON, M.D., Cincinnati, to Miss Helen Sebel of Avondale, Cincinnati, September 3.

JOSEPH S. DOUGHERTY, M.D., Lena, Wis., to Miss Josie O'Callaghan of Iron Mountain, Mich., August 25.

WILLIAM ALOYSIUS DELANEY, M.D., to Miss Elizabeth C. McHenry, both of Mitchell, S. Dak., September 3.

CHARLES MERRILL ROSE, M.D., Galesburg, Ill., to Miss Marguerite Connery of Chicago, September 21.

JOHN WILLIAM BOREN, M.D., Marinette, Wis., to Miss Esther V. Johnson of Chicago, September 1.

GRIFFITH A. DEMAY, M.D., Indianola, Neb., to Miss Elsie Portz of Uniontown, Wash., September 4.

LOUIS SHALET, M.D., to Miss Elsa Helen Adeleine Müller, both of New York City, September 11.

WILSON GEORGE SMILLIE, M.D., Boston, to Miss Faye Anderson at Denver, Colo., September 2.

HARRY W. ROSENTHAL, M.D., to Miss Ruth A. Masbach, both of Baltimore, September 9.

DAVID NISAN RAPPOPORT, M.D., to Miss Bluma C. Bayuk, both of Philadelphia, August 28.

CHARLES EDWARD VIDT, M.D., Buechel, Ky., to Miss Bernice Hughes of Louisville, June 13.

FRANK P. DWYER, M.D., Renovo, Pa., to Miss Mary Howell of Altoona, Pa., July 29.

"patent medicine" testimonial—none whatever. The exploiters of Sanatogen put forward some testimony, however, that purports to have a certain authority. This is a statement to the effect that "Sanatogen acts as a strong stimulus as far as the recuperative powers of the blood are concerned."

This claim is based on biologic experiments carried out by two physicians, Drs. G. Mann and J. G. Gage, the record of whose work was published in the *Lancet*, Oct. 19, 1912. The article of Mann and Gage was gone over with some care and the experiments there described did not seem to justify the conclusions reached by the authors. As it had been published in the *Lancet*, a medical journal of standing, whose publishers apparently thought it of sufficient importance to warrant the expense of a colored plate insert, it seemed worth while to have the work of Mann and Gage reviewed and its con-

Three series of experiments were made and reported by Drs. Mann and Gage, comparing the histology of the blood in starvation and during the height of digestion. The experiments of the first series were made on six students, the starvation period being thirty-six hours, ordinary food being taken after the thirty-six hours' fast, so far as can be gathered from Dr. Mann's report. It was found that during the height of digestion the nuclei of the lymphocytes and leukocytes stain more deeply, and that there is a slight decrease in the cytoplasm and consequent diminution in the size and number of the granules of the neutrophil and the eosinophil cells, in comparison with the blood during fasting.

The experiments of the second series were made on 100 frogs that had starved for months, blood-films being taken at varying periods after feeding 1 gm. Sanatogen. The changes noted in the white blood-cells of the frogs were practically identical with those described in the case of the six students. Increased cell division is stated to occur. The nuclei of the erythrocytes stain more deeply and the cells are increased in size, and exhibit increased cell division twenty-four hours after the feeding.

The third series consisted of one experiment on Dr. Mann himself. He fasted twenty hours and then took 15 gm. of Sanatogen in a cup of water. Practically the only change noted in the blood after the feeding was a deeper staining of the nuclei of the white cells. To quote:

"The changes in the granules of the polymorphonuclear leukocytes and in the eosinophils were much less marked than in the specimens supplied by the students, and the diminution in the size of the white cells was so insignificant as to be hardly noticeable."

Assuming that the blood-changes reported are correct, is the conclusion warranted that Sanatogen is a powerful recuperative stimulant to the blood?

In the first place, it remains to be proved, for there is as yet positively no evidence that the deeper staining of the nuclei during digestion and absorption of a protein meal represents "recuperative power of the blood" or processes of "feeding" on the part of the white cells. The actual significance of these changes requires further investigation. The increased division of the blood-cells described by Dr. Mann in the frogs was not observed by him in man. This phenomenon in the frogs is, in all probability, associated with the extraordinary length of the starvation period (months) and the well-known seasonal variations in the physiology of this species.

In the second place, waiving for the moment the question of the significance of the blood-changes observed, the evidence, so far as it goes, points to the conclusion that the greater affinity of the nuclei of the white cells for the stain is brought about by the feeding of any protein food. The experiments do not demonstrate any different or more marked effect from Sanatogen than from other protein foods.

The test on the six students with ordinary food can be considered as a control on the single Sanatogen test on Dr. Mann himself. The blood-changes in the students were more marked than in Dr. Mann.

Although Mann and Gage say that six frogs were used as controls, they do not say how the controls were treated, or draw any comparison between the controls and the frogs fed with Sanatogen. So far as the report goes, therefore, the only basis for comparison is afforded by the work of one of Dr. Mann's pupils, H. G. Butterfield. This worker, as quoted by Mann, found that on feeding newts after two weeks' starvation with a worm the size of a wooden match, the nuclei of all tissues (excepting nerve cells) take a much deeper stain than in the control animals. To pronounce Sanatogen, on the basis of the facts reported, a "powerful stimulus" to blood-formation is a piece of special pleading, if not of downright disingenuousness. Considered on its own merits, the work would not have appeared to me worthy of being repeated for the purpose of checking up such obviously unwarranted conclusions. In order to comply with the request made of me, however, I have repeated Dr. Mann's experiments:

EXPERIMENTS BY PROFESSOR CARLSON

I. TESTS ON MAN (A. J. C.)

1. 36 hours' fast followed by a meal of 25 gm. Sanatogen in water.
2. 36 hours' fast followed by a meal of 25 gm. casein in water.
3. 36 hours' fast followed by a meal of 200 c.c. of milk.

II. TESTS ON RATS

1. 4 animals, 72 hours' fast followed by a meal of Sanatogen in water.
2. 2 animals, 72 hours' fast followed by a meal of crackers and milk.

PAY YOUR MONEY AND TAKE YOUR CHOICE

"Sanatogen"

MADE IN GERMANY
CASEIN - - - 95%
GLYCEROPHOSPHATES - 5%

"SANATOGEN" is just as good as "B B X" or Cottage Cheese—and no better.

\$1.00 WORTH OF "SANATOGEN"



1

"B B X"

MADE IN AMERICA
CASEIN - - - 95%
GLYCEROPHOSPHATES - 5%

"B B X" is just as good as "Sanatogen" or Cottage Cheese—and no better.

\$1.00 WORTH OF "B B X"



2

Casein

MADE IN AMERICA
CASEIN - - - 100%

CASEIN is just as good as "Sanatogen" or "B B X"—if not better.

\$1.00 WORTH OF CASEIN



3

Above is a photographic reproduction of one of the exhibits made at Atlantic City at the last annual meeting of the American Medical Association.

Jar 1 contains 3½ ounces of the casein-glycerophosphate combination made abroad and sold under the name "Sanatogen;" it costs One Dollar.

Jar 2 contains 2 pounds 13½ ounces of a casein-glycerophosphate combination made by an American casein company; it costs One Dollar. For the same money, then, one gets nearly 15 times as much of this casein-glycerophosphate combination made in America as when the casein-glycerophosphate combination is sold under the name "Sanatogen" and manufactured abroad.

Jar 3 contains one dollar's worth of pure casein. The casein entirely fills the jar, although the weight of the material is the same as the weight of the casein-glycerophosphate combination in Jar 2. Pure casein is more bulky than the casein-glycerophosphate combination.

Again we would emphasize that the chief objection to Sanatogen is not its high price but the fraudulent claims under which it is sold.

clusions checked by parallel experiments. A. J. Carlson, professor of physiology at the University of Chicago, was asked to do this work and kindly undertook it. His report follows:

Report of Professor Carlson

I am asked to review the work done by Drs. G. Mann and J. G. Gage, from which they draw the following conclusions:

"Sanatogen [sodium caseinogenate glycerophosphates] further stimulates blood-cells to undergo nuclear division, which during the early period is mostly amitotic. . . . Therefore, it is evident that Sanatogen acts as a strong stimulus as far as the recuperative powers of the blood are concerned."

3. 2 animals, 72 hours' fast followed by a meal of casein in water.
4. 2 animals, 72 hours' fast followed by a meal of casein and sodium glycerophosphate in water.

Blood-films were taken at intervals during the fasting period and for twenty-four hours after feeding was resumed. The technic of fixing and staining given by Drs. Mann and Gage was followed in every detail in order to make my results comparable with their findings.

RESULTS

My results may be summarized as follows:

1. The only change in the blood-cells that could be detected with certainty in rats or in man, after feeding with Sanatogen or after feeding with other foods, was a deeper staining of the nuclei of the white cells in the films taken after feeding as compared with the films taken during fasting. This difference is generally distinct and unmistakable, although individual cells can always be found in the fasting and the feeding preparations that show no difference in affinity for the dyes. To this extent my results confirm those of Mann and Gage. I was not able, however, to make out any constant difference in the size of the cells, quantity of cytoplasm, or size and number of cytoplasmic granules similar to those reported by Mann and Gage.

2. There was no difference in the affinity for stains on the part of the white blood-cells in films taken after feeding Sanatogen and those taken after feeding milk, crackers, casein, and casein and sodium glycerophosphate. This is true for the tests both on man and on rats.

3. The above-mentioned difference in the staining of the cell nuclei was somewhat more marked in the tests on rats than in the tests on man, probably owing to the longer starvation period in the case of rats.

It has already been stated that the significance of this increased affinity for dyes in the nuclei of the white blood-cells must be determined by further investigation. It may be related to the change in the titration alkalinity of the blood rather than an evidence of "recuperative power" on the part of the blood, as it is well known that starvation induces acidosis, while during digestion the alkalinity of the blood is distinctly increased. If we assume that increased staining reaction during digestion indicates "increased recuperative power of the blood" it follows that such common and inexpensive foods as milk, crackers and casein are just as "powerful stimuli" to this recuperation as Sanatogen.

The extensive researches of Mendel and Osborne have shown that casein is in a certain sense a perfect food in that it is, in normal animals, capable of promoting growth and maintaining nitrogenous equilibrium, at least for long periods of time. The burden of proof, however, rests with the promoters of Sanatogen to show that the casein in Sanatogen is superior to the natural product of the cow.

Conclusion

From the findings in Professor Carlson's report on this disguised puff of a mendaciously exploited proprietary, about all that remains to be said is that it is humiliating to find such pseudo-science not only built up by members of a profession trained in science, but also given currency and authority by a medical journal of high standing.

The Character of Lister.—In the midst of his great triumph Lister preserved, unstained from the breath of vanity, the noble qualities of character that were his. He was ever gentle, courteous and firm. Trying as are the exactions and responsibilities of an important surgical post, Lister was never known to speak a sharp word to house surgeon, dresser or any one in his service. His scientific spirit and discovery attracted the curiosity of the students and young graduates of Edinburgh; his personal nobility won their hearts. His art of winning their loyalty was by inspiring enthusiasm and giving encouragement. "Often in the middle of a trying operation," wrote one of his pupils, "a gentle smile bestowed on us young students when we were honestly trying to do our best as assistants was most encouraging." Many of his students afterward confessed that their contact with Lister was the best and purest influence of their lives.—G. T. Wrench, *Lord Lister, His Life and Work*.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

FORMULAE FOR LIQUID SOAP

To the Editor.—I would be pleased to have you criticize the following formula for making liquid soap.

	gm. or c.c.
Sodium hydroxid	80
Potassium hydroxid	80
Cottonseed oil	1,000
Alcohol	500
Water	2,500

Dissolve the hydroxids in 500 c.c. of water. After solution has been effected, add the alcohol, and, finally, the cottonseed oil in several portions, and shake thoroughly until saponified. Finally add water sufficient to make _____.

To the soap liquid thus prepared add:

	gm. or c.c.
Potassium carbonate	30
Terpineol	12
"Evergreen A," sufficient to produce a grass-green color.	

We have been trying to make this soap for use in the operating room, but have never succeeded in making a clear solution with the formula as it stands; there has always been an insoluble residue left. I would be specially pleased to know if the quantity is to be "q. s." 2,500 c.c. or if enough water should be added after the addition of 2,500 c.c. to make complete solution.

A. E. CONTER, M.D., Chattahoochee, Fla.

ANSWER.—The trouble encountered is probably due to the fact that saponification was not complete before the addition of the remaining portion of water. The procedure should be modified to take advantage of the heat generated by the solution of the caustic alkalies in the mixture of water and alcohol, deferring the addition of the final portion of water until after all the oil has been thoroughly saponified. Add the sodium hydroxid and potassium hydroxid to 500 c.c. of water in a suitable container, add one-half the quantity, or 250 c.c., of the alcohol; then add the oil gradually with constant stirring or occasional shaking, and after a uniform emulsion has been formed allow to stand until the mixture is practically transparent, indicating that the oil has been thoroughly saponified; then add the remaining portion of alcohol and 2,500 c.c. of water. This should readily make 5,000 c.c. or more of the liquid soap which, while slightly alkaline, is not objectionably so.

A simpler formula has been suggested by Mr. Thum of the German Hospital of Philadelphia. This formula is somewhat more economical and produces a soap that is less alkaline in reaction. It may be flavored and colored to suit:

	gm. or c.c.
Sodium hydroxid	55
Potassium hydroxid	65
Cottonseed oil	800
Alcohol	500
Water	to make 5,000

Dissolve the hydroxids in 60 c.c. of water, add all of the oil and 100 c.c. of alcohol at once and stir continuously until a permanent emulsion has been formed; allow to stand until saponification is complete and add remainder of alcohol, and water sufficient to make up the volume.

USE OF TALCUM POWDERS

To the Editor:—1. Can you inform us whether talcum powder possesses any therapeutic value in the treatment of skin affections?

2. What is the effect of plain talc on the skin? Why is it good for the skin, if it is good?

3. Exactly what is the effect of boracic acid on the skin?

4. About what proportion of boracic acid to talc should a talcum powder contain to be most beneficial?

5. What is the effect on the skin of any other ingredients contained in talcum powder?

6. Do you know of any investigations made, or have you had any experience, as to the comparative value of different commercial talcum powders, and what did such investigations and experience disclose?

J. WALTER THOMPSON COMPANY, New York.

ANSWER.—1 and 2. The effect of any powder on the skin can only be somewhat protective and dehydrating. On the other hand there is a tendency to the formation of crusts and pastes, due to mixture of the powder with sweat or other secretions.

3. The effect of boracic acid is slightly antiseptic, but there is some doubt as to even this slight value when the chemical is applied in powder form.

4. The salicylated talcum powder of the National Formulary contains 10 per cent. boric acid. The importance of this powder depends rather on the salicylate, however, than on the other ingredients. Various commercial talcum powders contain small quantities of different antiseptic and perfuming agents. For absorbent purposes by far the most effective powder is magnesium carbonate powder.

5. In general it may be stated that talcum powders seem to have but little value from a therapeutic point of view, and their value esthetically must be considered entirely from the point of view of the individual employing them.

REFERENCES TO PSYCHANALYSIS

To the Editor:—Please explain or refer me to an explanation of psychanalysis.
J. A. BALSLEY, M.D., Santa Monica, Cal.

ANSWER.—The following is a list of references on this subject:

Burrow, T.: The Psychanalyst and the Community, *THE JOURNAL*, June 13, 1914, p. 1876.

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Solomon, M.: Psychoanalysis, *New York Med. Jour.*, May 9, 1914.

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Oberndorf, C. P.: Scope and Technic of Psycho-Analysis, *Med. Rec.*, New York, Nov. 29, 1913.

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Tannenbaum, S. A.: Psychoanalysis, *New York Med. Jour.*, Feb. 7, 1914; *Med. Rec.*, New York, Feb. 21, 1914.

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Hesnard, A.: Freud's Method of Psychanalysis, *Jour. de méd. de Bordeaux*, May 25, 1913.

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MILK OF MAGNESIA—LACTOSE OR GLUCOSE IN URINE

To the Editor:—1. Please give a formula for making milk of magnesia.

2. I have a patient who is six months pregnant; her urine gives a very decided yellow precipitate with Fehling's solution. Is there any way to determine if this is lactose or glucose except with a polariscope? We have no polariscope. B. S. A.

ANSWER.—Milk of magnesia is a synonym for magma magnesiac, an aqueous suspension of magnesium hydroxid, made by reaction between magnesium sulphate and sodium hydroxid (see National Formulary). Each teaspoonful contains about 3 grains of magnesium hydroxid. It is used as an antacid and mild laxative in adult doses of 8 c.c. (or 2 fluidrams). Unless made with water free from iron and organic matter, the magma is likely to be discolored.

2. If a specimen of urine reacts with Fehling's solution and with Nylander's test, but fails to give a reaction with phenylhydrazin and does not ferment with yeast, the presence of lactose may be inferred. If the urine be boiled with 2 per cent. sulphuric acid and then neutralized, its optical activity will be increased and it will be capable of undergoing fermentation.

DEFINITION OF A CORONER'S CASE

To the Editor:—When is a case a coroner's case in New York State? X. Y. Z., New York.

ANSWER.—Chapter 410, Section 1773, Laws of 1882, reads as follows: "If a person dies from criminal violence or by a casualty, or suddenly while in apparent health, or when unattended by a physician or in prison, or in any suspicious or unusual manner, the case must be referred to the coroner."

Medical Education and State Boards of Registration

COMING EXAMINATIONS

COLORADO: Denver, October 6. Sec., Dr. David A. Strickler, Empire Bldg., Denver.

DISTRICT OF COLUMBIA: Washington, October 13-15. Sec., Dr. George C. Ober, 125 B St., S. E., Washington.

GEORGIA: Atlanta, October 13-15. Sec., Dr. C. T. Nolan, Marietta.

IDaho: Wallace, October 6. Sec., Dr. John F. Schmershall, Jerome.

ILLINOIS: Chicago, October 6-8. Sec., Dr. C. St. Clair Drake, Springfield.

KANSAS: Topeka, October 13-15. Sec., Dr. H. A. Dykes, Lebanon.

LOUISIANA: New Orleans, October 29-31. Sec., Dr. E. L. Leckert, New Orleans.

MICHIGAN: Lansing, October 13-15. Sec., Dr. Beverley D. Harrison, 504 Washington Arcade, Detroit.

MINNESOTA: Minneapolis, October 6-9. Sec., Dr. Thomas McDavitt, Lowry Bldg., St. Paul.

MISSISSIPPI: Jackson, October 27-28. Sec., Dr. E. H. Galloway, Jackson.

MISSOURI: Kansas City, September 28-30. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.

MONTANA: Helena, October 6. Sec., Dr. William C. Riddell, Helena.

NEW JERSEY: Trenton, October 20-21. Sec., Dr. H. G. Norton, Trenton.

NEW MEXICO: Santa Fe, October 12. Sec., Dr. W. E. Kaser, East Las Vegas.

OKLAHOMA: Muskogee, October 6-8. Sec., Dr. John W. Duke, Guthrie.

RHODE ISLAND: Providence, October 1-2. Sec., Dr. Gardner T. Swarts, State House, Providence.

WEST VIRGINIA: Clarksburg, October 13. Sec., Dr. S. L. Jepson, 81 Twelfth St., Wheeling.

WYOMING: Kemmerer, September 28-30. Sec., Dr. H. E. McCollum, Laramie.

Pennsylvania June Report

Dr. N. C. Schaffer, secretary of the Bureau of Medical Education and Licensure of Pennsylvania, reports the written examination held at Philadelphia, June 1-2, 1914. The total number of subjects examined in was 5; total number of questions asked 50; percentage required to pass 75. The total number of candidates examined was 78, of whom 65 passed and 13 failed. The following colleges were represented:

College	PASSED	Year Grad.	Total No. Examined
University of Southern California	(1912)		1
Georgetown University	(1913)		3
Chicago College of Medicine and Surgery	(1911,1); (1913,1)		2
University of Louisville	(1913)		1
Baltimore Medical College	(1910,1); (1913,1)		2
Johns Hopkins University	(1912)		1
Maryland Medical College	(1912,5); (1913,1)		6
University of Maryland	(1903)		1
New York Homeo. Med. Coll. and Flower Hospital	(1912)		1
Starling-Ohio Medical College	(1913)		1
Hahnemann Med. Coll. and Hosp., Phila.	(1912,1); (1913,7)		8
Jefferson Medical College	(1912,1); (1913,11)		12
Medico-Chir. Coll. of Phila.	(1912,2); (1913,12); (1914,1)		15
Temple University	(1912)		1
University of Pennsylvania	(1912,3); (1913,4)		7
University of Pittsburgh	(1913)		1
University of Toronto	(1911)		1
Kaiser-Wilhelms University, Germany	(1913)		1

College	FAILED	Year Grad.	Per Cent.
University of Louisville	(1911) 58.8, 72; (1913)		63.8
Maryland Med. Coll.	(1912) 63.4, 61.8, 62.2; (1913)		64.2, 62.6
Hahnemann Medical Coll. and Hosp., Phila.	(1913)		71
Woman's Medical College of Penna.	(1910)		72
Royal University of Naples, Italy	(1895) 64.4; (1913)		68.8
National University of Athens, Greece	(1910)		69.8

The following questions were asked:

PHYSIOLOGY, PATHOLOGY AND BACTERIOLOGY

1. Describe the lesions in typhoid fever. Outline the laboratory tests for verifying the diagnosis. 2. Describe the lesions, name the causes and outline the laboratory technic for demonstrating the varieties of inflammations of the eyes of the newborn. 3. Give a case of incipient tuberculosis of the lungs. Outline the laboratory tests that would aid in confirming the diagnosis. 4. Give an acute case of peritonitis (a) how are the toxins absorbed? (b) discuss the rationale of the sitting position and enteroclysis in the treatment of the above condition. 5. Given a case of gonorrheal infection, describe the heart lesions that may result. Contrast the disturbed functions of such a heart with the functions of a normal heart. 6. Contrast the blood-picture in leukemia and pernicious anemia with that of normal blood. 7. Describe the lesion in (a) gastric ulcer; (b) carcinoma of the stomach. Differentiate these lesions by laboratory methods. 8. Differentiate, by an examination of the spinal fluid, the various forms of meningitis. 9. Name two pathologic

conditions that usually have icterus as a symptom. What is the significance of icterus, (a) as regards the liver? (b) as regards digestion? 10. Briefly describe the types of gangrene. What is understood by the "line of demarcation?"

DIAGNOSIS, SYMPTOMATOLOGY, TOXICOLOGY AND MEDICAL JURISPRUDENCE

1. Describe the symptoms of the various forms of asthma, and differentiate them from chronic bronchitis. 2. State in detail the symptoms diagnostic of ileus, and name four conditions which may cause it. 3. Describe the symptoms of diphtheria and differentiate it from follicular tonsillitis. 4. State the symptoms of rubella (Roetheln) and differentiate it from measles, scarlet fever and urticaria. 5. Describe the symptoms diagnostic of gonorrheal arthritis, and differentiate it from tubercular joint. 6. State the symptoms of iritis and differentiate it from glaucoma and keratitis. 7. Differentiate aortic regurgitation from mitral regurgitation. 8. Enumerate the symptoms of a poisonous dose of (a) bichlorid of mercury; (b) aconite; (c) arsenic. Give the immediate treatment for each one. 9. On what data would you base a diagnosis of (a) syphilis? (b) tetanus? (c) gonorrhea? Name one laboratory test for each. 10. What precautions, from a medicolegal standpoint, should the physician or surgeon exercise when treating fractures or dislocations?

OBSTETRICS, GYNECOLOGY AND PHYSIOLOGICAL CHEMISTRY

1. Enumerate the causes of backward displacement of the womb, (a) in nulliparas, (b) in multiparas. Discuss the treatment in each case with reasons for the same. (Omit description of operation). 2. Give the methods of making an early diagnosis of cancer of the uterus, (a) cervix, (b) fundus. Outline an appropriate treatment for each. (Omit description of operation.) 5. Outline a satisfactory preparatory treatment for plastic operations on the vagina, giving reasons for each step. 4. Name four abdominal enlargements which may be mistaken for advanced pregnancy (seven months or more) and differentiate each from such possible pregnancy. 5. State the probable causes of vomiting of pregnancy. What methods would you adopt for its relief and state the theory on which you would use the remedies advised. 6. Given a pregnant woman (the first three months), what symptoms would indicate a possible abortion? In case the abortion occurred, how would you treat the case? (Omit description of operation.) 7. Discuss the various toxemias of pregnancy from the viewpoint of premonitory symptoms. Discuss their treatment (a) prophylactic, (b) after having become well established. 8. Give arguments for and against the so-called low protein food standard. 9. Explain the relationship between the pigment of the blood, bile and feces. 10. Explain the processes of physiological chemistry by which indican is ultimately eliminated and where is it ultimately found.

SURGERY AND ANATOMY

1. State the avenues and possible points of metastasis of a malignant growth of the breast. On what symptoms may an early diagnosis of cancer of the breast be based? 2. State (a) what structures may be injured in a subcoracoid luxation of the humerus. (b) How may this condition be recognized? (c) How may it be corrected? 3. Name three usual causes of rectal strictures. Outline (without details) a palliative operation for this condition. 4. Enumerate (without explanations or details) conditions which might exist in a patient tending to complicate and render more dangerous a surgical operation. 5. What conditions would call for catheterization of the male bladder? Describe in detail a proper method. 6. Describe (a) a method of preventing surgical shock; (b) its treatment. 7. In the case of an abdominal operation, give in detail (a) a method of preparing the patient; (b) the surgeon. Give reasons for each step. 8. Outline (a) methods of prevention; (b) the treatment of bed sores. 9. In fractures of the upper third of the femur, what is the usual position of the fragments? What muscular action causes the same? 10. What anatomic structures are involved in flat-foot? What methods of treatment would you adopt for its correction?

PRACTICE AND THERAPEUTICS AND MATERIA MEDICA, HYGIENE AND PREVENTIVE MEDICINE

1. Describe the therapeutic action of suprarenal gland, thyroid gland and pituitary body. 2. Outline the management of a case of syphilis in both the primary and tertiary stages. 3. Name two remedies and the indications for their use in each of the following conditions: 1, impetigo contagiosa; 2, scabies; 3, tapeworm; 4, hemoptysis; 5, croup (non-diphtheritic). 4. Name and describe three methods for the purification of water intended for drinking purposes. 5. On what theories or principles are cold baths and cold sponging resorted to? State the indications calling for such measures. 6. Give in detail the dietetic and hygienic rules and regulations you would prescribe in a case of diabetes mellitus. 7. Outline the management of a case of nocturnal enuresis. 8. Explain the difference between the principles underlying vaccine therapy and serum therapy. State the character of danger in their application to the human body. 9. What errors in diet or hygiene or occupational conditions may cause or aggravate acute eczema? Write a prescription for a suitable application stating the special purposes expected to be accomplished. State one drug to be used internally, with the reasons for its employment. 10. Give the hygienic measures tending to prevent epidemic "colds." Give the management of an acute attack, including three remedies and reasons for their use.

Book Notices

RADIUM AND RADIO-THERAPY. Radium, Thorium and Other Radio-Active Elements in Medicine and Surgery. By William S. Newcomet, M.D., Professor of Roentgenology, Temple University. Cloth. Price, \$2.25 net. Pp. 315, with 72 illustrations. Philadelphia: Lea & Febiger, 1914.

The knowledge of radium introduces the physician to a strange world. When one begins to talk of transformations of one element into another, the chemical ideas in which many physicians now in practice were educated are out-raged; and when the exact length of life of elements varying from two minutes to 8,000,000,000 years is calculated, one can only wonder what science will next bring forth. It must be acknowledged that radium is a powerful agent and at the same time a dangerous one, and if the physician is to handle this new power he must have a thorough knowledge of its capabilities and limitations. This means that he must have a new education in a large field of chemistry. Owing to the cost of the material this knowledge can be gained by approved methods of experimental science only to a limited extent. Text-books must be resorted to, and for this purpose the present work is very well adapted. The practical consideration of the therapeutic use of the radio-active elements is conservative, but up to date. The author gives the following estimate of the value of these preparations in internal medicine:

"The exact status of these radio-active elements in internal medicine is by no means a settled question; perhaps the observations in some instances have been greatly exaggerated; yet, at the same time, from an experimental standpoint these elements produce changes which have been noted by most careful observers, who practically agree on the salient points, and from their deductions it is rational to adopt some of the conclusions which have brought about the application of these elements. But as most of the diseases in which they have been employed belong to a class for which certain forms of treatment have been periodically promulgated, to be used for a short time and finally be forgotten, more proof must be given of their efficiency before they can be universally adopted."

This book will be found serviceable to medical men, both to those who are using or who propose to use radium as well as to those who want to familiarize themselves with all knowledge regarding it.

THERAPEUTICS, DIETETICS AND HYGIENE. An Australian Text-Book. By John William Springthorpe, M.A., M.D., M.R.C.P., Senior Physician to the Melbourne Hospital. Two Volumes. Cloth. Price, 25 shillings net per volume. Pp. 1120, with illustrations. Melbourne: James Little, 1914.

Australia is a new continent with new ideals which extend to the domain of medicine and hygiene as well as to politics and sociology. Among the physical ideals is the hope that by the culture of a pure white race a state of physical perfection may be attained which will outstrip anything that the world has yet seen. Dr. Springthorpe has entitled his work an Australian text-book, intimating at least that it expresses something of the high aims of Australian medicine. It is published in two volumes. One characteristic of the author's work is the attempt to correlate the psychic and the physical and to base his science as well as his practical methods on a philosophy which recognizes mind associated with matter, if not supreme over it, in the whole realm of science. Hence he includes mental and moral influences in his study of the causes of disease and in the consideration of the methods of hygiene. Aside from the peculiar point of view given by the fact that this is especially an Australian text-book, attention must be called to the prominence given throughout the book to the public relations of hygiene. The subject of education is discussed from the intellectual and emotional side as well as the physical. The portrayal of child life is not limited to a description of physical degenerations and deformities, but takes in the effect of immoral environment as well. The author indulges in much philosophizing and quotes some interesting passages which appear

What is Scholarship?—The answer is: The discovering, the organizing and the explaining of new facts. Only the uninformed and unscholarly are in the habit of designating the mere diffusion of knowledge as scholarship.—F. C. Brown, —Science.

to have little to do with the immediate subject. On the topic of public hygiene the author gives some valuable observations on the topographic peculiarities of the different parts of Australia, giving its climate conditions with some detail. The subjects of water-supply, sewage, ventilation, housing, clothing and hygienic habits are discussed with special relation to the national needs and peculiarities.

The volume on therapeutics is less local and presents the remedies and principles of treatment which are familiar to other parts of the civilized world. There is a description of Australian mineral springs, watering places and sanatoriums. No note seems to be made of an indigenous vegetable materia medica. Vaccine therapy receives due consideration. In approaching radiotherapy the author again indulges in some speculation and recalls the fact that "to-day science confidently bases the whole of physics and chemistry on an ethereal substratum." Further on he says: "Hence in the most modern refinements of therapeutics we find ourselves in the ethereal stage, and separated by the narrowest of margins, if separated at all, from the immaterial and the psychical. Thus in x-rays, radiotherapy and ionic medication, we are close to the very essence of things, and to the very origin of life itself." The chapter on this subject is, however, not very long, and the powers attributed to radium are very moderate. The volume is concluded by a chapter entitled "Therapeutic Memorabilia" which contains a large number of hints on the treatment of a variety of diseases.

To one who can find in the expressions of therapeutists a finger pointing to future developments of the healing art, these two volumes with their antipodal flavor and their philosophic trend may indicate a new phase of medical teaching. Their scientific value is somewhat diminished by the rhetorical padding, which, although good in itself, is not exactly scientific. They form interesting reading, but it is unfortunate that their typography in many places does no credit to Australian printing. They are illustrated by a number of very good plates.

THEORIE UND PRAXIS DER BLUTENTZIEHUNG, NACH DEM GEGENWÄRTIGEN STANDE DER WISSENSCHAFT BEARBEITET. Von Prof. Dr. Heinrich Stern, Oberarzt für Innere Medizin am St. Mark's Hospital, New York. Paper. Price, 3.50 marks. Pp. 144, with 15 illustrations. Würzburg: Curt Kabitzsch, 1914.

It is at any rate an interesting if not important indication of the international character of our medical literature that an increasing number of American physicians contribute to German journals and publish more or less extensive works in the German language. The present work by Dr. Stern is an example of this tendency. The subject is as old as medicine, and while the present century presents the lowest ebb of bloodletting in therapeutics, yet enough scientific fact and clinical experience are found to constitute a very good defense of the ancient practice. While it is safe to say that a very large portion of the present generation of physicians have no experience in the use of the lancet, it may very well be that an extension of this method would follow if those who know little or nothing of it would give time to a careful perusal of the evidence in favor of this powerful mode of influencing the blood-pressure and the metabolism. There appears to be a lack of monographs on this subject in English which we may hope to see supplied either by a translation of Stern's work or by the publication of a new one.

TEXT-BOOK OF ANATOMY AND PHYSIOLOGY FOR TRAINING SCHOOLS AND OTHER EDUCATIONAL INSTITUTIONS. By Elizabeth R. Bundy, M.D., Member of the Medical Staff of the Woman's Hospital of Philadelphia. Third Edition. Cloth. Price, \$1.75 net. Pp. 408, with 233 illustrations. Philadelphia: P. Blakiston's Son & Co., 1914.

This work ought to be entitled "Applied Anatomy and Physiology," as nearly every chapter ends with a paragraph or two headed "Surgical Notes" or "Clinical Notes," and this of course adds greatly to the value of the book. The illustrations are well selected. There is a table of systemic arteries in the old nomenclature, and tables of the systemic arteries and veins according to the Basle anatomic nomenclature. There is an excellent glossary which, however, does not give the origin of the words.

Medicolegal

Entitled to Recover for Quarantining Infantile Paralysis (Shidler vs. York County (Neb.), 146 N. W. R. 949)

The Supreme Court of Nebraska holds that a duly licensed physician, acting under the order of the State Board of Health in quarantining and suppressing a highly contagious disease, may recover of the county, where such disease was prevalent, the actual expenses incurred by him and the reasonable value of his services. The court says that in the summer and fall of 1909 there was a large number of cases of what is commonly called "infantile paralysis" in York County. Many of the communities in the stricken territory were thrown into a condition approaching panic, and notably among those communities was the city of York in York County. The then chairman of the county board of health expressed himself as opposed to a quarantine, and failed and refused to call a meeting of the county board of health, or to take any other measures relative to the disease, or to the investigation or control of it, and, on July 20, 1909, the State Board of Health ordered that said disease be quarantined in York County, and by its order instructed the state health inspector to communicate its order to the plaintiff, and to require him to establish and maintain a rigid quarantine of said disease throughout that county. The plaintiff, a duly licensed physician, was at that time a member of the board of health in that county, but he was not the county physician, and was under no contract with, and received no salary from, the county, as a member of its board of health or otherwise. He proceeded to quarantine the disease wherever he could find it in his county, and was occupied with his duties in that behalf from about July 20 to October 1. It appeared that he came into contact personally with about 250 cases of the disease, and devoted his time to those cases to the partial exclusion of his other practice; that, in the performance of those duties, he incurred and paid necessary expenses in the sum of \$225; that for his own services in the premises he charged the county supervisors the sum of \$267.50. From this latter sum there was deducted four or five items for the quarantine of cases within the proper limits of certain towns and villages. The board of supervisors rejected his claim, but the District Court rendered a judgment in his favor, against the county, for \$508.60 and costs taxed at \$14.75. That judgment is now affirmed, because, as the Supreme Court views the case, the county was liable to Dr. Shidler for the reasonable value of his services, and the expenses necessarily incurred by him in rendering them.

Physician Not Liable for Hot-Water Bottle Injury in Hospital

(Stewart et al. vs. Manasses (Pa.), 90 Atl. R. 574)

The Supreme Court of Pennsylvania says that this action was against the family physician of a woman, by whose advice she went to a public hospital for a surgical operation. After the operation she was burned by a hot-water bottle that had been left by a hospital nurse in the bed in which she was placed. Recovery of damages was sought on the ground that the injury was caused by the negligence of the defendant, or that of the nurse, for whose action he was answerable. It was alleged that the defendant agreed to perform the operation, and to treat the patient with care and skill while under his charge, and to furnish her the services of a skilful nurse, and that he failed in the performance of his duty in this regard. The evidence showed that the defendant was a member of the associated staff of the hospital and had the privilege of sending patients there for treatment either by himself or by the regular hospital physicians and surgeons; that he agreed for a stipulated sum to perform the operation, but the hospital expenses were to be paid by the patient, to whom he gave a letter of introduction that secured her admission to a private room in the hospital; that she was prepared for the operation by hospital nurses

under the direction of the directress of nurses and etherized by a physician employed by the hospital for that purpose; that she was operated on by the chief hospital surgeon assisted by the defendant, and was removed from the operating-room to the recovery room by hospital nurses and the physician who had etherized her; that the defendant followed them into the recovery room and stood near the foot of the bed when she was placed in it; that the duty of preparing the beds in the recovery room and placing the patients therein rested entirely with the directress and the hospital nurses, the surgeons having nothing to do with it, and that this was the general rule in hospitals. Under these circumstances there was no liability on the part of the defendant for the injury caused by the negligence of a hospital nurse, and a non-suit was properly entered.

Medical Witnesses Need Not Be Licensed Physicians in State

(*Rugenstein vs. Ottenheimer (Ore.)*, 140 Pac. R. 747)

The Supreme Court of Oregon holds that the fact that a medical witness called in this personal injury case was not a physician regularly licensed to practice in that state did not militate against his competency as an expert. The only object of license is to prevent an unqualified person from practicing medicine and surgery; but a man may be ever so learned and well qualified to give an opinion, and yet not be engaged in practice. It is the duty and within the province of the court as a preliminary question of fact to determine whether or not the witness is qualified as an expert, to the end that he may give an opinion in evidence, and the appellate courts will not disturb the decision of the trial court, unless there is no evidence to sustain the preliminary decision of that court. The fact that the witness in question had been licensed to practice medicine in California, and had been so engaged since, was competent evidence for the consideration of the court in determining his fitness as an expert witness.

Society Proceedings

COMING MEETINGS

Amer. Academy of Ophthal. and Oto-Larynx., Boston, Oct. 19-21.
American Association of Railway Surgeons, Chicago, Oct. 14-16.
Association of Military Surgeons of the U. S., Cincinnati, Sept. 29-Oct. 2.
Delaware State Medical Society, Wilmington, Oct. 13-14.
Idaho State Medical Association, Boise, Oct. 8-9.
Minnesota State Medical Association, St. Paul, Sept. 30, Oct. 1-2.
Mississippi Valley Med. Assn., Cincinnati, Oct. 27-29.
Nevada State Medical Association, Reno, Oct. 13-15.
New Mexico Medical Society, Albuquerque, Oct. 5-7.
Utah State Medical Association, Salt Lake City, Sept. 29-30.
Vermont State Medical Society, Rutland, Oct. 8-9.
Virginia Medical Society, Washington, D. C., Oct. 27-30.
Wisconsin State Medical Society, Oshkosh, Oct. 7-9.

COLORADO STATE MEDICAL SOCIETY

Forty-Fourth Annual Meeting, held at Boulder, Sept. 9-11, 1914

The President, Dr. O. M. GILBERT, Boulder, in the Chair

Rôle of Chronic Intestinal Indigestion in Children in Production of Epilepsy

DR. J. W. AMESSE, Denver: Intestinal putrefaction, associated with chronic constipation and chronic intestinal indigestion, forms one of the most important etiologic factors in arousing epileptic paroxysms. In general, disorders of digestion have been shown to be more concerned with the nervous instability of children than is commonly supposed. The management of these cases involves the most rigid survey of domestic and personal hygiene. Whether the toxemia is or is not associated with major disturbances of the nervous system, isolation of the child, preferably in a hospital, is most desirable. Where, as will obtain in the great majority of cases, this separation from the home is not feasible, the absolute cooperation of mother and nurse is indispensable. The

hygienic management will not only embrace a proper dietary, but full instructions in writing must be furnished regarding hours of sleep, the character and amount of exercise, periods of rest, baths, fresh air and suitable clothing. In my experience these children are usually heavy milk drinkers, the balance of their ration consisting of starch in the form of potato, bread, rice, etc. The distention of the abdomen from the flatulence invariably set up by this diet is apparent on first examination. The most effective method is to change the food from a carbohydrate to protein ration, depending on albumin-milk, fermented milk, or buttermilk for a beverage only.

DISCUSSION

DR. HERBERT B. WHITNEY, Denver: The healthy stomach has a great deal of reserve power and will digest almost anything. There are cases, however, of disease of the stomach largely inherited, a nervous condition which predisposes to epilepsy. Where there is chronic indigestion at about the age of 6, 8 or 10 years, we have a difficult problem so far as treatment is concerned, and these cases demand a more accurate knowledge of dietetic principles in the treatment of dyspepsia in infancy itself. I am accustomed to put these children on an exclusively milk diet and gradually go on to the so-called antifermentive diet which comprises chiefly meats, eggs, vegetables, spinach, with exclusion of all sugars and starches, and also some forms of toast and bread, with soups, especially bouillon and consomme, etc.

DR. J. A. BLACK, Pueblo: I have in mind two children who were nearly of the same age. They were born of parents of the same character and moved in the same class of society. One child was a boy, the other a girl. One child was breast-fed and developed into a beautiful baby. The other child when born was a puny struggling little thing. The mother of the child that was bottle-fed followed instructions. After two or three months the child began to grow rapidly. The child is now 5 years of age and has never had a day's sickness. The other child that was breast-fed was allowed to eat indiscriminately all kinds of candies and cakes and the result was in a few months it developed gastro-intestinal trouble. After a few months or years the child had an attack of rheumatism and at the present time it is bordering on chorea.

DR. FRANK P. GENGENBACH, Denver: A girl at the age of puberty had some convulsive attacks. She was very frail, thin, had grown rapidly, was of marked nervous temperament and was a big eater. She would fall over and have a certain amount of twitching, but her face would be pallid rather than congested. She had several of these attacks a few weeks apart. Dr. Pershing decided that the child had beginning epilepsy, and recommended that she be put on bromids. As her blood-pressure was rather low she was given digitalis, and as she was anemic she was given iron, nux vomica, general stomachics, and he suggested a curtailment of the diet, and that the processes of elimination be looked after. As a result of this line of treatment the child did not have another attack for over a year, and then an attack was brought on by overeating. It was the last attack the girl had.

DR. H. G. WETHERILL, Denver: From 1882 to 1884 I was intern in the New Jersey State Asylum in Trenton, and in investigating the peripheral irritations which gave rise to epilepsy I found we had in that institution thirty-three male epileptics of varying ages, many of them boys. I made a careful study of the relationship of the epilepsy in these thirty-three males to phimosis. I found many of them needed circumcision. We started a campaign of this operation for the younger ones particularly, and the effect on the epilepsy for the first few months was marked. There can be no possible question that peripheral irritations, such as accompany phimosis and intestinal troubles from indigestion and improper feeding, have a very definite causative effect in producing these conditions.

Nasal Treatment of Dysmenorrhea

DR. L. B. LOCKARD, Denver: It has long been established that a definite physiologic and pathologic relationship exists

between the nose and throat and the sexual organs, particularly in the female, but the clinical significance of this relationship has not been grasped by the profession at large.

We have no way of foretelling in an individual case whether it is one of nasal dysmenorrhea or whether the pain is due to pelvic lesions. Complete failures have resulted in cases in which no pelvic disease has been demonstrable, and, on the other hand, some of the most brilliant results have occurred in individuals in whom various uterine and ovarian abnormalities existed. As a general rule it may be said that patients without organic disease of the sexual organs offer the most promising prognosis.

DISCUSSION

DR. T. E. CARMODY, Denver: Many nervous conditions affect the nose as well as the sexual organs. Headaches due to menstrual disorders are frequently relieved by packing the nose with cocain.

DR. H. A. SMITH, Delta: A girl came to me five years ago with obstruction on one side of the nose. I removed a spur of bone about half an inch in diameter from the anterior end of the middle turbinate. Nothing was said about any gynecologic condition. A year later her mother told me that she had not had any pain since her nose was operated on, whereas prior to that time she suffered a good deal of pain. The psychic effect must be left out of that case.

DR. ROBERT LEVY, Denver: In spite of a great many attempts to prove scientifically that there is a distinct relation between the nose and the genital organs, I think we must in the ultimate analysis conclude that many of these remarkable effects, if not all of them, are psychic.

Typical and Atypical Cases of Addison's Disease

DR. GEORGE H. CATTERMOLLE, Boulder: My first case was that of a minister, 29 years old, who came to Colorado on account of pulmonary tuberculosis. He received tuberculin treatment for about six months and was much improved, so that he engaged in outdoor occupations. Finally, in the spring of 1909, he took up the work of a house-painter, which kept him outside and constantly exposed to the sun, so that the first bronzing was thought to be tan. A little later, however, the bronzing became more intense and was noticed over the portions of the body protected by the clothing. This was a typical case of Addison's disease, showing the bronzing, asthenia and digestive symptoms. With the bronzing there was a loss of strength and then failure of appetite and diarrhea. At necropsy the left lung showed a healed cavity at the apex. There was no active trouble apparent in the lungs. The suprarenals showed enlargement and were both calcareous and caseous.

The second case was that of a married woman, 27 years old, who was sent to Boulder in August, 1913, because she was not getting along well at home. She had been coughing for four or five years and had a bad tuberculous family history. Examination of the chest showed only limited involvement in the apices. There was pain in the right lumbar region which had existed for several months. The peculiarity in this case was the slight amount of discoloration in the skin. There was an anemic pallor with an uncertain fawn color, but not a typical bronzing. At her home she had been kept in the sunshine and this could account for some tanning. We could not account for so much prostration, for such feeble circulation, and so much digestive disturbance resulting from the pulmonary trouble. In those cases of tuberculosis in which the prostration is greater than can be accounted for by the trouble in the lung, we should remember the possibility of the chromaffin system being diseased and possibly try the use of the suprarenal gland or its products as a therapeutic test and a remedial agent.

(To be continued)

The Last Word in Diagnosis.—There is no sign or symptom that may not be fallacious. The most experienced judgment is fallible.—Arthur E. Giles, *Clinical Journal*.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago September, VIII, No. 3, pp. 185-256

- 1 *Diagnosis and Prognosis of Congenital Heart Disease. C. H. Dunn, Boston.
- 2 *Experiences with Whey Modified Milk in Infant Feeding. J. S. Leopold, New York.
- 3 *Relation of Bovine Tuberculosis to Early Tuberculosis in Children. T. C. McCleave, Berkeley, Cal.
- 4 *Influence of Lactose on Metabolism of Infant. F. B. Talbot and L. W. Hill, Boston.
- 5 Examination of Chest in Children. R. M. Smith, Boston, and C. D. Sweet, Fresno, Cal.
- 6 *Absorption of Fat from Intestinal Tract of Actively Tuberculous Child. F. W. Schlutz, Minneapolis.

1. **Congenital Heart Disease.**—The following rules for differential diagnosis are given by Dunn. A case showing cyanosis with enlargement of the cardiac dulness or palpable thrill, or both, is one of pulmonary stenosis. If the baby dies shortly after birth, the most probable lesion is pulmonary stenosis alone. If the baby survives early infancy, or lives on into childhood, the pulmonary stenosis is probably associated with some other lesions. If the murmur is notably transmitted into the vessels of the neck, or if a "humming top" murmur is present, the additional lesion is probably open ductus arteriosus. If the murmur has neither of these characteristics, the complicating lesion is probably defective interventricular septum.

A case showing a murmur and enlargement, without cyanosis, is probably defective interventricular septum. If the murmur is not transmitted into the vessels of the neck, this lesion exists alone. If the murmur is so transmitted, or if the "humming-top" murmur is present, the lesion is probably combined with open ductus arteriosus. A case showing a murmur, without either cyanosis or enlargement, especially if the murmur is markedly transmitted into the vessels of the neck, or if it extends into diastole, is probably one of open ductus arteriosus alone. If the murmur is of the "humming-top" variety, extending throughout the cardiac cycle, the diagnosis of this lesion is almost certain.

The prognosis of the various congenital cardiac lesions and their combinations, Dunn says, does not vary with the character of the lesions except in two forms, namely, pulmonary stenosis alone, and open ductus arteriosus alone. In all the other forms and combinations there is evidence that any patient may survive, and even live to adult life. On the other hand, the evidence shows that development and nutrition suffer to a varying degree, and that the children are in general less resistant, many of them dying young of various additional affections, such as the gastro-intestinal or infectious diseases. The prognosis in babies cyanotic at birth is grave, as many of them have pulmonary stenosis alone, and die within a very short time. In those who survive, the pulmonary stenosis is probably combined with some compensating lesion, and is that of congenital cardiac disease in general. In cases which show the clinical picture of open ductus arteriosus alone, the prognosis is very good. The patients do not usually show any interference with development or nutrition, but develop normally, with eventual disappearance of the signs of cardiac disease.

2. **Whey Modified Milk.**—Of 54 infants who received whey modified milk very good results were obtained in 36 cases, fairly good results in 10 cases and poor results in 8 cases. Two cases in infants over 6 months of age, 2 cases of atrophy, 1 case of exudative diathesis, 1 case of influenza, 1 case of enteritis and 1 case of nervous vomiting did not do well on whey modified milk. Based on the results obtained by Leopold while using 'Schloss' whey modified milk during a period of two years he offers the following conclusions: Whey modified milk is indicated whenever breast milk is not obtainable. Much better results are obtained with this milk mixture than with any other method of artificial feeding, in institutions where milk is especially

indicated in very young infants, and in infants under 3 months of age.

3. **Bovine Tuberculosis.**—McCleave maintains that it is unquestionably the duty of physicians to instruct their patients and the public that bovine tuberculosis is, without giving it undue weight and always keeping it in proper subordination to the larger problem of infection from human sources, a grave menace to human health, but that it is, by the simple expedient of home pasteurization, a disease most easily prevented in man.

4. **Influence of Lactose on Metabolism of an Infant.**—Talbot and Hill claim that increasing amounts of sugar up to a certain limit increase the retention of nitrogen, and beyond that point may diminish the absorption and possibly the retention of nitrogen. Increasing amounts of sugar do not affect the absorption of fat up to a certain point, beyond which point there may be a diminished absorption of fat. Sugar given beyond certain limits may result in a greatly increased acidity of the stool and diarrhea. The diarrhea is probably a result of the increased peristalsis. Clinical evidence of a carbohydrate fermentation is the scalded, irritated skin of the buttocks and the green, watery acid stools. The retention of ash seems to depend on the amount of sugar in the food. When the amount of sugar is increased beyond a certain point, there may be a negative balance and the ash may be lost from the body. It is impossible to say whether this negative balance is due to the diarrhea, or the increased acidity of the stool, or other factors in which fat plays a part. Clinically, the amount of sugar which an infant can digest and absorb varies with the individual. There is no fixed point in a given individual at which sugar will or will not be digested at a given time. Other factors than the amount of sugar may influence its digestion.

6. **Fat in Tuberculosis.**—The series of cases reported by Schlutz comprises all the common forms of tuberculosis and includes four cases with pulmonary involvement alone, four with pulmonary glandular involvement, three with pronounced glandular involvement only, three cases of bone tuberculosis, in one of which there was also marked glandular involvement and one in which there was pulmonary and suspected peritoneal involvement. The fat absorption is distinctly diminished only in the glandular type of tuberculosis. The stools in three of the cases showed both macroscopic and microscopic evidence of fat, considerably in excess of the normal. The same was shown by the quantitative determinations. In all the other forms of tuberculosis the fat absorption very nearly approached the normal. The one case suspected as peritoneal showed good fat absorption. This study brought out the interesting fact that the fat absorption was if anything improved by the addition of certain amounts of carbohydrate to the diet.

The results of this series of cases seem to show in Schlutz's opinion that fat absorption in most of the common forms of tuberculosis is practically normal and is likely to be diminished only in those cases in which there is extensive glandular and lymphatic involvement. If it were a question of fat absorption only, high fat feeding would not be contra-indicated in most forms of tuberculosis. To what extent scrofulous or exudative manifestations, apparently unfavorably influenced by fat-rich food, should influence the diet of the tuberculous child, Schlutz says, is a question which the individual case must determine. The presence of the exudative condition apparently does not influence fat absorption. Experimental and clinical evidence both seem to show that a diet which insures the largest amount of fat deposit in the tissue, with the least retention of water, is the one most beneficial to the tuberculous child.

Boston Medical and Surgical Journal

September 3, CLXXI, No. 10, pp. 365-400

- 7 Dissociated Personality. E. G. Grey and W. R. Sisson, Boston.
- 8 Pyogenic Infections of Upper Urinary Tract. A. L. Chute, Boston.
- 9 Treatment of Movable Kidney with or without Infection, by Posture. H. Cabot and L. T. Brown, Boston.
- 10 Roentgen Determination of Certain Renal and Ureteric Variations and Disorders. P. Brown, Boston.

- 11 Early Diagnosis and Treatment of Manic Depression. A. H. Ring, Arlington Heights.
- 12 Scheme for Promoting Efficiency in State Sanatoria. W. C. Bailey, Boston, and C. C. MacCorison, Reading.
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- 13 Syphilis in Massachusetts. A. Post, Boston.
- 14 Syphilis of Eye in Hereditary Syphilis. G. S. Derby, Boston.
- 15 Vascular and Cardiac Syphilis. G. G. Sears, Boston.
- 16 Syphilis of Tonsil. C. M. Smith, Boston.
- 17 Syphilis of Lung. E. A. Burnham, Boston.
- 18 Relation of Syphilis to Internal Medicine. D. L. Edrall, Boston.
- 19 What the City Should Do to Control Syphilis. T. B. Shea, Boston.

Iowa State Medical Society Journal, Washington

August, II, No. 2, pp. 109-185

- 20 Conservation of Hearing. T. U. McManus, Waterloo.
- 21 Intracranial Pathology and Fundus Changes. G. F. Harkness, Davenport.
- 22 Unfavorable Results Following Gastro-Enterostomy. C. DeJong, Fort Dodge.
- 23 Specific Treatment for Lupus and Other Parasitic Lesions of Skin. J. W. Kime, Fort Dodge.
- 24 Treatment of Puerperal Sepsis. H. M. Stowe, Chicago.
- 25 Practice of Principles of Medical Ethics. J. H. Schrup, Dubuque.
- 26 Traumatism of Hip in Children and Adolescents. A. Steindler, Des Moines.
- 27 Are Thorough Examinations Worth While? J. F. Studebaker, Fort Dodge.
- 28 Study of Parathyroids. C. H. Churchill, Fort Dodge.
- 29 Infant Feeding. G. A. Bielesheimer, Reinbeck.
- 30 Indications for Paracentesis of Tympanum. R. E. Robinson, Waverly.

Journal of Cutaneous Diseases, New York

September, XXXII, No. 9, pp. 607-682

- 31 Spinal Fluid with Reference to Involvement of Nervous System in Secondary Syphilis. U. J. Wile and J. H. Stokes, Ann Arbor, Mich.
 - 32 Abderhalden Technic as Applied to Diagnosis of Syphilis. H. R. Varney and P. F. Morse, Detroit.
 - 33 White Spot Disease. G. M. MacKee and F. Wise, New York.
- 31 and 32. Abstracted in THE JOURNAL, June 13, p. 1920.

Journal of Experimental Medicine, Lancaster, Pa.

September, XX, No. 3, pp. 201-319

- 34 Parameningococcus and Its Antiserum. M. Wollstein, New York.
- 35 Metabolism of Calcium, Magnesium, Sulphur, Phosphorus and Nitrogen in Acromegaly. O. Bergeim, F. T. Stewart and P. B. Hawk, Philadelphia.
- 36 Calcium Metabolism after Thyroparathyroidectomy. O. Bergeim, F. T. Stewart and P. B. Hawk, Philadelphia.
- 37 Method for Estimating Bacteria in Circulating Blood in Rabbits. C. G. Bull, New York.
- 38 Localization of Virus and Pathogenesis of Epidemic Poliomyelitis. S. Flexner and H. L. Amoss, New York.
- 39 Experimental Tuberculosis of Cornea. P. A. Lewis and C. M. Montgomery, Philadelphia.
- 40 Excretion of Nitrogen in Fever. N. C. Sharpe and K. M. B. Simon, Toronto, Ont.
- 41 Liver Function as Influenced by Ductless Glands. G. H. Whipple and P. W. Christman, Baltimore.

34. **Parameningococcus and Its Antiserum.**—The parameningococci of Dopter, Wollstein states, are culturally indistinguishable from true or normal meningococci, but serologically they exhibit differences as regards agglutination, opsonization and complement deviation. Because of the variations and irregularities of serum reactions existing among otherwise normal strains of meningococci it does not seem either possible or desirable to separate the parameningococci into a strictly definite class. It appears desirable to consider them as constituting a special strain among meningococci, not, however, wholly consistent in itself. The distinctions in serum reactions between normal and parameningococci are supported by the differences in protective effects of the monovalent immune sera on infection in guinea-pigs and monkeys. It is therefore concluded by Wollstein that it is highly desirable to employ strains of parameningococcus in the preparation of the usual polyvalent antimeningococci serum. It remains to be determined whether it is better to employ the parameningococci along with normal meningococci in immunizing horses, or to employ normal and para strains separately in the immunization process and to combine afterward, in certain proportions, the sera from the two kinds of immunized horses.

35. **Metabolism in Acromegaly.**—A distinct retention of calcium, magnesium and phosphorus was noted by the author.

which was not accompanied by corresponding changes in general metabolism as evidenced by a practical balance of nitrogen and sulphur. It is concluded that there is a primary disturbance in the metabolism of the mineral elements mentioned, with the probable formation of new bony tissue. The distribution of elements between urine and feces shows no abnormal variations.

36. Calcium Metabolism after Thyroparathyroidectomy.—The metabolism of calcium was studied by the authors in a man after complete removal of the thyroid and parathyroid glands. A slight retention of calcium (0.4578 of a gm. of calcium oxid in the ten-day period) was noted. The urinary calcium excretion was low, averaging 0.0134 of a gm. per day on a daily ingestion averaging 1.6736 gm. of calcium oxid. A slight increase was observed during the period of study in the calcium content of the blood. No symptoms of tetany were noted in the patient, who survived operation thirty-nine days. The low urinary and blood-calcium values are taken to show deficient absorption of calcium, which may bear some relation to the decreased gastric secretion after parathyroidectomy. Attempts are made to explain the non-occurrence of tetany as due to the high calcium intake and to the development of a compensatory mechanism in which the pituitary body may play a part.

37. Bacteria in Circulating Blood.—When rabbits are injected intravenously with a quantity of virulent streptococci or pneumococci sufficient to cause death within two to four days the septicemia takes a definite course with slight variations. The bacteria rapidly decrease in number from the time of the injection to from two to four hours, at which time the blood is sterile or contains only a few bacteria. Within five to six hours the bacteria reappear in the blood and steadily increase until the death of the animal. If the bacteria are less virulent, the same quantity of culture causes a chronic type of infection. The same initial decrease in the number of bacteria occurs. The reentrance into the blood is somewhat delayed, the septicemia does not reach the height obtained in the acute cases, and a second fall occurs within the course of a few hours. These rabbits show a low blood-invasion or a sterile blood-culture for several days. During this time they become emaciated to a marked degree. Then the low septicemia rapidly rises or the rabbit with a sterile culture develops a severe septicemia within a few hours and death takes place from a few hours to two days thereafter. In this type of infection local lesions, pericarditis, pleurisy, peritonitis, etc., are usually found. In the infections which run an acute course no gross lesions are found.

If the bacteria are still less virulent they never reenter the blood after the initial disappearance and the rabbits remain in good condition. Variations in the natural resistance of individual animals may be sufficient to cause quite marked irregularities in the course of the infection. Pneumococci can be standardized so as to produce a particular type of infection more easily than streptococci. In general infections such as those produced by streptococci and pneumococci the number of the bacteria present in the circulating blood at a given time supplies accurate and delicate information regarding the severity of the disease.

A large number of bacteria found in the blood and tissues at autopsy do not necessarily prove the existence of a heavy infection before the onset of the death agony, since it is a well-known fact that bacteria multiply with enormous rapidity, once the natural resistance of the animal has been overcome. Again, the individual animals of the same species, age and apparently of identical physical condition react to the aggressive force of the infecting organisms variously. This fact is readily found out by the injection of a series of rabbits with lethal quantities of bacteria per body-weight, and by making tests at various periods before death results, which, in the case of streptococci, ranges from one to six days.

38. Localization of Virus of Epidemic Poliomyelitis.—Flexner and Amoss hold that the virus of poliomyelitis is capable of penetrating the retina without producing apparent injury, to reach the central nervous organs. The virus

injected into the blood is deposited promptly in the spleen and bone-marrow, but not in the kidneys, spinal cord or brain. Notwithstanding the affinity which the nervous tissues possess for the virus, it is not removed from the blood by the spinal cord and brain until the chorioid plexus and blood-vessels have suffered injury. The intervertebral ganglia remove the virus from the blood earlier than do the spinal cord and brain.

An aseptic inflammation produced by an intraspinal injection of horse-serum facilitates and insures the passage of the virus to the central nervous organs, and the production of paralysis. The unaided virus, even when present in large amounts, passes inconstantly from the blood to the substance of the spinal cord and brain. When the virus within the blood fails to gain access to the central nervous organs, and to set up paralysis it is destroyed by the body, in course of which destruction it undergoes, as a result of the action of the spleen and, perhaps, other organs, diminution of virulence.

The histologic lesions that follow the intravenous injections of the virus in some, but not in all, cases differ from those which result from intraneural modes of infection. In escaping from the blood into the spinal cord and brain, the virus causes a lymphatic invasion of the chorioid plexus and widespread perivascular infiltration, and from the latter cellular invasions enter the nervous tissues. A similar lymphoid infiltration of the chorioid plexus may arise also from an intracerebral injection of the virus.

The histologic lesions present in the central nervous organs in human cases of poliomyelitis correspond to those that arise from the intraneural method of infection in the monkey. The virus in transit from the blood through the cerebrospinal fluid to the substance of the spinal cord and brain is capable of being neutralized by intraspinal injection of immune serum, whereby the production of paralysis is averted. The experiments described support the view that infection in epidemic poliomyelitis in man is local and neural, and by way of the lymphatics, and not general and by way of the blood. Hence Flexner and Amoss uphold the belief that the infection atriun is the upper respiratory mucous membrane.

39. Experimental Tuberculosis of Cornea.—As a result of their studies Lewis and Montgomery believe that tuberculosis is primarily an exudative inflammation and secondarily proliferative in its character. More than that, they are led to the belief that the cellular exudate, protective though it may be in purpose, is defective and is destructive in its actual influence. Even the phagocytic activity of the cells of such an exudate may probably serve to distribute living bacilli and thus spread the disease to fresh areas.

40. Excretion of Nitrogen in Fever.—The rise of temperature following typhoid vaccination is accompanied by a marked increase in the output of total nitrogen, creatinin, and especially of uric acid. The reaction to tuberculin is slower, but is also accompanied by an increased output of nitrogenous substances, that is, however, less uniform and generally less pronounced. In a case of malaria studied by the authors there was a tendency for the rise of temperature to be accompanied by an increased output of total nitrogen and less uniformly of creatinin; on two days on which the fever was preceded by rigor the output of uric acid was increased.

41. Liver Function as Influenced by Ductless Glands.—Whipple and Christman found that adrenal insufficiency produced by extirpation of three-fourths or more of the gland tissue will be associated with a drop in liver phthalein excretion. With hypertrophy of the adrenal fragment the excretion comes back to normal, but may fall again when more adrenal tissue is removed. Pancreatic insufficiency causes a progressive fall in the phthalein excretion, indicating a grave lowering of the functional capacity of the liver. This fact has a direct bearing on the question of diabetes. Parathyroid insufficiency with tetany causes no decrease in phthalein output, but at times a rise above normal. This comes out best when the phthalein curve is low following pancreas extirpation. Parathyroid tetany may cause hyperactivity on the part of the liver cells. Thyroid insufficiency produces no change

in the uniform curve of phthalein excretion. Hypophysis insufficiency shows an initial fall in the curve, followed by a return to normal and a final drop in the last few days before death.

These experiments supply evidence to the effect that the liver is very much concerned in the derangement that follows the removal of the ductless glands. Hence it seems probable that this disturbance of the liver function may be an important factor in the general symptom-complex of ductless gland insufficiency.

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- 42 Surgical Clinics of Russia, Finland, Sweden, Norway, Denmark and Belgium. (To be Continued.) W. J. Mayo, Rochester.
- 43 Suggestions on Obstetric Technique. A. M. Brandt, Biemarck, N. D.
- 44 Chronic Gastric Disturbances: Differential Diagnosis. G. B. Easterman, Rochester.
- 45 Trials and Rewards of Physician. H. M. Johnson, Dawson.

Kentucky Medical Journal, Bowling Green

September 1, XII, No. 17, pp. 569-575

- 46 Diagnosis and Surgical Lesions of Urinary Tract. I. Abell, Louisville.
- 47 Vaccine Therapy and Widal Reaction in Typhoid. B. W. Wright, Bowling Green.
- 48 Intestinal Parasites with Reference to Uncinariasis. J. W. Stephenson, Pikeville.
- 49 Urethritis. L. T. Eckler, Falmouth.
- 50 Gun-Shot Wound of Abdomen. Report of Case. A. W. Cain, Somerset.

Lancet-Clinic, Cincinnati

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- 51 Symptoms and Physical Signs of Approaching Organic Disease. C. L. Mix, Chicago.
- 52 Trismus. H. H. Hoppe, Cincinnati.
- 53 Graduates of Medical Department of University of Pennsylvania who Have Taught or Practiced in Cincinnati. (To be continued.) A. G. Drury, Cincinnati.

Medical Record, New York

August 22, LXXXVI, No. 8, pp. 321-362

- 54 Low Table Position and Other Aids to Performing Suprapubic Prostatectomy. C. L. Gibson, New York.
- 55 *Coccygodynia. Treatment by Injections of Alcohol. F. C. Yeomans, New York.
- 56 Four Cases of What Appeared to be Tuberculous Meningitis with Apparent Permanent Arrestment. C. C. Browning, Los Angeles.
- 57 Syphilis of the Lungs Simulating Pulmonary Tuberculosis. J. Blinder, New York.
- 58 Prevention of Schoolroom Disease and Dust. C. W. Crampton, New York.
- 59 Malarial Fever. L. Sexton, New Orleans.
- 60 State Prevention and Pulmonary Tuberculosis. T. J. Mays, Philadelphia.
- 61 Necessity for Parental Cooperation in Examination of Mental Defectives. J. T. Krause, Brooklyn.

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- 62 Immediate Results of Salvarsan Treatment of Syphilis, as Judged by Wassermann Reaction, Using Cholesterin Fortified Antigen. E. G. Stillman, New York.
- 63 Auto-Immunization in Respiratory Infections. C. H. Duncan, New York.
- 64 Origin of Auscultation and Percussion and the State of Clinical Medicine in Time of Auenbrugger and Laennec. R. C. Newton, Montclair, N. J.
- 65 Public Health Education. H. Greeley, Brooklyn.
- 66 Useful Surgeon. H. W. Wightman, Omaha, Neb.
- 67 Herpes Zoster and Malaria. W. H. Deaderick, Hot Springs, Ark.
- 68 Cerebral Syphilis in Secondary Stage. C. B. Craig, New York.
- 69 Detection of Gelatin in Ice-Cream. D. I. Macht, Baltimore.

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- 70 *Physiology of Gastric Motility. W. J. Mallory, Washington, D. C.
- 71 Present Stage in Treatment of Syphilis. C. M. Williams, New York.
- 72 Case of Tuberculosis of Sclera of Probable Primary Origin. G. H. Bell, New York.
- 73 Neglect of Aged. I. L. Nascher, New York.
- 74 Medical Bugbear: Dispensary Abuse. M. M. Davis, Jr., Boston.
- 75 Syphilophobia. D. W. Montgomery, San Francisco.

55. Coccygodynia Treatment by Injections of Alcohol.—The treatment proposed by Yeomans is an application of the principle of injection of sensory nerves with 70 to 80 per cent. alcohol, thereby causing their degeneration as suggested by Schlösser in 1907. All of Yeomans' seven cases were of the type of neuralgia or neuritis of the coccygeal nerves in which this method is peculiarly applicable, though he thinks it should be tried in all cases of coccygodynia, whatever

their nature, as its application is simple and harmless. It may relieve the distressing pain even though it does not affect its cause. The patient, with rectum empty, assumes the left lateral (Sims') position on a firm table, with the thighs well flexed on the abdomen, and the region of the coccyx is painted with tincture of iodine. An all-glass Luer or similar sterile syringe of 2 centimeters capacity is filled with 90 per cent. alcohol and armed with a 2-inch needle of fine gauge. The right index finger is now inserted into the rectum and the point of maximum tenderness is determined by counter pressure with thumb outside. Maintaining the finger in the rectum to guard against its puncture and to act as a guide, the needle is now introduced through the midline directly to the painful spot. When this is reached the patient exclaims from pain that is exquisite but tolerable, and the injection of 10 to 20 minims is made slowly. The needle is withdrawn and its puncture sealed with collodion after neutralizing the iodine on the skin with alcohol. The pain from the injected alcohol lasts a few minutes only and may be followed by a dull ache for a day or two. As a rule, three and at the most five injections should suffice. The interval between the injections should vary from five to ten days—one week on the average—and they are to be made always at the joint which is found most tender at the time of injection.

70. Physiology of Gastric Motility.—By means of the local autonomous neuromuscular mechanism, Mallory states, the stomach is capable of performing its motor functions in an essentially normal manner, even when separated from the central and sympathetic nervous systems by section of both vagi and both splanchnic nerves. Normally, however, the gastric motor functions are modified by many extrinsic influences. Motor impulses, and those for increasing tonus and accelerating peristalsis, pass through the vagus nerves. These impulses are increased by mental excitement and impaired by physical exhaustion. Inhibitory influences, those for reducing tonus and retarding peristalsis, pass principally through the splanchnic nerves. These impulses are increased by mental depression and impaired by the internal secretions of the adrenals. The functions of the pyloric sphincter are under the control of conditions in the stomach, and are modified by nervous reflexes from the duodenum and small intestine.

The following agents have a sufficiently definite effect on gastric motility to be of therapeutic value; heat and cold applied to the abdomen externally; massage of the abdomen; atropin, physostigmin, pilocarpin, either by mouth or by hypodermic injection; hypophysis extract and suprarenal extract intravenously. Surgical operations performed on the stomach for the purpose of facilitating the discharge of gastric contents are sometimes only a partial success, or even an entire failure, when planned and executed in conformity with anatomic relations rather than physiologic considerations. The size, shape, position, tonus and capacity of the stomach vary under physiologic conditions. Therefore, in a gastro-intestinal anastomosis, the operation should be so performed and the stoma so situated that the discharge of gastric contents would not be hindered, but facilitated by the physiologic motility of the stomach. Gastric and intestinal peristaltic waves should run in the same direction. The stoma should be situated in the pyloric antrum, in which the expulsion of gastric contents will depend on peristalsis instead of gravity and in which it will be lowest when the stomach is nearly empty.

Modern Hospital, St. Louis

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- 76 Meat Hygiene in United States—Its Value and Scope. W. H. Lipman, Chicago.
- 77 Hospital Organization and Accounting System. H. M. Wechsler, New York.
- 78 Relation of Work to Social Service. M. I. Husted, Clifton Springs, N. Y.
- 79 Artificial Illumination in Hospitals. M. J. Sturm, Chicago.
- 80 Presentation of Theoretical Work to Student Nurses. M. C. Wheeler, Chicago.
- 81 Items in Hospital Efficiency—Nursing of Patients. J. A. Hornsby, Chicago.

- 82 Feeding the Hospital—Introduction. L. Graves, Chicago.
83 Evanston General Hospital's Contagious Pavilion. M. J. Sturm, Chicago.
84 Planning for Health—Pressing Problem. F. Brush, New York.

New Orleans Medical and Surgical Journal

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- 85 Arkansas Child Welfare Association. W. H. Deaderick, Hot Springs, Ark.
86 Blood-Pressure—Reference to "Energy Index" and "Cardiac Load." G. W. Norris and J. R. Davies, Philadelphia.
87 How To Fit Glasses. T. J. Dimitry, New Orleans.
88 Prophylaxis of Typhoid. G. E. Henson, Jacksonville, Fla.
89 Two Attacks of Herpes Zoster in Same Individual. D. W. Montgomery, San Francisco.
90 Severe Case of Vincent's Angina. E. M. Dupaquier, New Orleans.

New York Medical Journal

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- 91 *Phenol Instillation in Treatment of Bladder Tuberculosis. E. L. Keyes, Jr., New York.
92 Compulsion Neurosis. Report of Case. A. Stern, New York.
93 *Abdominal Incisions and Intra-Abdominal Pressure. M. J. Horan, New York.
94 Diagnostic Aids in Diseases of Bones and Joints. L. Keller, New York.
95 *New Instrument for Intravenous Injection. J. Frankel, New York.
96 Autolactotherapy. C. H. Duncan, New York.
97 Tonsil from Surgical Point of View. M. Lubman, New York.
98 Congenital Absence of Uterus and Adnexa. B. K. Chowdry, Calcutta, India.
99 Second Infection with Spirocheta Pallida. B. C. Corbus, Chicago.
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100 Tubercularization and Immunization. (To be Concluded.) M. Fishberg, New York.
101 Paraffin Treatment of Constipation. J. H. Kellogg, Battle Creek, Mich.
102 Newer Teachings Concerning Diseases of Gastro-Intestinal Tract. M. I. Knapp, New York.
103 Indications of Gastric Ulcer and Its Surgical Treatment. C. G. Cumston, Geneva, Switzerland.
104 Appendicostomy in Case of Chronic Ulcerative Coloproctitis. J. F. Saphir, New York.
105 Study of Renal Functional Activity by Means of Phenolsulphone-phthalein. J. P. Jones, Philadelphia.
106 Case of Sciatica Entirely Cured in Three Weeks' Treatment. H. Marcus, New York.
107 Systematized Education of Public Health Matters. H. Greeley, New York.
108 Contributions which Women Have Made to Medical Literature. M. M. Loomis, Chicago.

91. Tuberculosis of Bladder.—Keyes has modified Rovsing's treatment to the extent of employing phenol in instillation instead of irrigation, and in solutions of a strength varying in accordance with the sensitiveness of the patient. He begins with a solution of one to 200 of water and rapidly increases this to 1 per cent. before the patient complains of an increase in pain. The half dozen patients on whom he has been able to employ this technic have shown no great benefit until the solution reached a strength of from 2 to 5 per cent. In two instances he has even employed a super-saturated solution, drawing into the instillator a few minims of pure phenol, and then a few minims of water, thus making an emulsion, of which one or two minims may be instilled into the posterior urethra. The reaction from such an instillation is likely to be very marked. Its use is justified only where all else fails. It is not necessarily any more efficacious than the solutions.

93. Abdominal Incisions and Intra-Abdominal Pressure.—In four cases the esophagus was ligated by Horan through an incision in the neck, after placing a glass tube in the stomach, making the tube as secure and air-tight as possible with a ligature. An incision was made parallel to the umbilicus through the right rectus, and the rectum was ligated. The incision was closed in the ordinary manner, pressure being applied in all four cases to the full amount of the automobile gauge, viz., 120 pounds, and after the amount registered in one case, the pumping was continued until the abdomen looked to be twice the normal size. No hernia protruded in either case.

In two cases in which the incision was made in the right rectus, with the rectum ligated and the incision sutured, another incision was made in the median line from the sternum to the umbilicus, the tube was ligated within the stomach, and the incision was closed. In one case the pressure was 100 pounds and in the other 120 pounds. There was

no apparent rupture. There were six cases in which the incisions were made in the median line below the umbilicus, the pressure being introduced through the rectum in three, and through the stomach in the other three.

All cases herniated either through the sutures in the aponeurosis, or by a separation of the muscular fibers with pressure of 15 pounds in one case, 20 pounds in three cases, 40 pounds in one case and 110 in another. There were two cases in which transverse incision was made through the skin above the pubis, and the muscles were separated in the median line. One case with the tube in the esophagus, and the rectum ligated, withstood 120 pounds (male). The other case (female), the esophagus ligated with tube *in situ*, the rectum plugged with cotton, withstood but 40 pounds, a large hernia showing in the picture at 60 pounds.

In two cases in which the incision was made over the right rectus, the aponeurosis being dissected with the finger, the wound closed in the ordinary way; one cadaver withstood 80 pounds, the intestines puncturing at the cecum with about 10 pounds pressure in the other. The pressure was applied through the rectum in both cases, with the esophagus plugged with cotton. One case with an incision $5\frac{1}{2}$ inches long in the outer border of the rectus showed a hernia at the lower border of the incision, with 20 pounds pressure. In this case the ligature was placed at the duodenum, and pressure was applied through the rectum. In three cases with the incision over McBurney's point, with the muscles separated, the wounds closed; one case herniated with tearing of the muscular fibers at 20 pounds. There was no hernia in either of the other two cases. Two cases with the same incision, the muscles also incised, withstood 120 pounds, the pressure being applied through the esophagus. In three cases with the same incision as before, pressure applied through the rectum; one case herniated through the incision with 15 pounds pressure, the other two cases went over 120 pounds without pressure. In three cases of esophageal end of the stomach ligation through an abdominal incision, pressure applied through the rectum, two showed over 120 pounds pressure, and in the other the gut was punctured with about 10 pounds pressure.

In all of these cases the abdomen was left open. In seventeen cases the intestines were taken out of the abdominal cavity; only one of the number could be blown higher than 10 pounds. In all the other sixteen cases the air escaped almost as fast as it could be pumped in. This particular point shows the effect of low abdominal distention in some of the drainage cases.

95. New Instrument for Intravenous Injections.—The instrument devised by Frankel consists of: *A.* A perforated needle with a sharp cutting edge and point, about 2 to 3 inches long and about $\frac{1}{8}$ of an inch in diameter; the upper edge carries a crown-like arrangement within which fit a screw and cap to tighten the needle to the inner cannula. *B.* A cannula 1 inch longer than the needle, with a dull and rounded lower edge (so as easily to enter the lumen of the vein and be pushed within the vessel at least $\frac{1}{2}$ to 1 inch away from the point of injury, thereby preventing clotting, dislodgements, and spilling of the fluid within the tissues). This cannula fits snugly within the needle so as to be air-tight and still is very easily shifted in and out of the needle. The upper end of the cannula carries a crown like the needle, within which fits the third part. *C.* A perforated piece of metal whose upper part easily fits a piece of ordinary rubber tubing, while the lower end fits the upper part of the cannula. *D.* An ordinary piece of steel with sharp point called a stylet which keeps all parts together, clean and unobstructed, and can be used together with the cannula like a trocar for similar purposes.

Oklahoma State Medical Association Journal, Muskogee

September, VII, No. 4, pp. 109-139

- 109 Abdominal Injuries. G. A. Wall, Bartlesville.
110 Eternal and All Important Question in Gynecology—Cancer of Uterus. B. Saunders, Fort Worth, Tex.
111 Accessibility of Diseased Area About Neck of Uterus and Upper Vagina in Carcinoma of Cervix. G. H. Noble, Atlanta, Ga.
112 State Health Problems. J. C. Mahr, Oklahoma City.
113 Jackson's Membrane. F. H. Clark, Oklahoma City.

Public Health Journal, Toronto

August, V, No. 8, pp. 518-569

- 114 Public Abattoirs. J. T. J. Vallance, Lethbridge, Alta.
 115 Conditions Affecting Efficiency of Sewage Disposal Works in Canada. R. H. Murray.
 116 Economics of Sewage Disposal. R. Potter, Battleford, Sask.
 117 Results of Mechanical Gravity Filtration at Saskatoon, Sask. G. B. Clark, Saskatoon.
 118 Non-Identity of Modern Leprosy and Biblical Leprosy. H. W. Hill, London, Ont.
 119 Legal Aspect of Sanitary Inspectors' Work. T. Watson, Saskatchewan.
 120 Engineer and Social Service. S. Parry, Regina, Sask.
 121 How May Medical Health Officer Help Social Worker. J. H. T. Falk, Winnipeg.

September, No. 9, pp. 563-608

- 122 Exceptional Child. W. D. Tait, Montreal, Que.
 123 City Waste Disposal by Incineration. F. Cartledge, Moose Jaw, Sask.
 124 All the Typhoid of Community for Five Years from Carcass Through Milk. H. W. Hill, London.

South Carolina Medical Association Journal, Seneca

August, X, No. 8, pp. 605-635

- 125 Chronic Infections and their Relation to Internal Disorders. J. H. Gibbs, Columbia.
 126 Fallacy of Prescribing Alcoholic Beverages as Food or Medicine. R. M. Hammond, Montmorenci.
 127 Oral Hygiene. G. A. Milner, Aiken.
 128 Plea for Future. J. H. Hunter, Spartanburg.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

August 29, II, No. 2800, pp. 285-420

- 1 *Common Ailments in Camp: Their Significance and Prevention. C. Webb-Johnson.
 2 *Gangrene in War. C. M. Page.
 3 Analysis of Results of New Sight Tests of Board of Trade. F. W. Edridge-Green.
 4 *Late Infection Following Elliot's Trephining Operation. A. H. Griffith.
 5 *Causes of Blindness in Eleven Hundred Children. N. B. Harman.
 6 Factor of Heredity in Myopia. J. A. Wilson.
 7 Choice of Cataract Operation. E. E. Maddox.
 8 English Pellagra in Early Childhood. C. R. Box.
 9 Two Unusual Cases of Mastoiditis in Children. W. Wilson.
 10 Intraperitoneal Rupture of Bladder. N. Flower.
 11 Simple Method for Determining Amount of Glucose in Diabetic Urine and Other Liquids. A. F. Dimmock.

1. Ailments in Camp: Their Significance and Prevention.—Webb-Johnson says, it is a well known fact that common ailments in camp are responsible for a great wastage of public money and a loss of training for a large percentage of men; the greatest number of admissions to hospital is among men with less than one year's service, and the lowest is among men with eight years or more experience; also that the rate of admission into hospital is highest among men between 20 and 25 and lowest among men between 40 and 50.

2. Gangrene in War.—Page says if the types of gangrene seen under war conditions be classified in accordance with their etiology, they group themselves under the five following headings: 1. Gangrene secondary to the interference with the blood flow through the main vessels of a limb. 2. Traumatic gangrene. 3. Infective gangrene. 4. Gangrene due to vasomotor paralysis. 5. Gangrene secondary to the effect of high explosives. The occurrence of the disease in young men with healthy circulatory systems is the one feature which is common to all these types, and which differentiates them on the average from gangrene as met with in civil practice. This fact considerably affects the line of treatment and the prognosis.

1. Gangrene of the extremities is occasionally seen as a result of direct slow velocity gunshot injury to the main brachial or femoral vessels; it more often occurs when a bone injury is present as well. High velocity rifle bullets may pass through large vessels and at the time produce few symptoms; subsequently an aneurysmal varix will very likely appear. The symptoms of this latter condition may be evident within a week or so of the injury, and if operation is undertaken at this stage, probably involving ligation of the artery above and below the sac, gangrene of the affected limb is likely

to occur. 2. Traumatic gangrene is a term theoretically applied only to those cases in which death of a part results from direct injury, but it is evident that infection will be an important factor in the extent and progress of the condition. 3. Acute infection with many organisms may cause some degree of local tissue necrosis. The term "infective gangrene," however, is usually reserved for those cases in which the process is definitely progressive and associated with toxemia. Under such a classification come phlegdema and the gangrene due to the bacillus of malignant edema and the *Bacillus aerogenes capsulatus*. 4. The cases of symmetrical gangrene which were seen by Page in large numbers among Turkish troops in the last months of 1912 resulted from a vasomotor disturbance. There were some differences of opinion in regard to the cause responsible for the condition. About half the men affected were suffering from enteritis. All gave a history of being exposed for long periods on wet ground and of having been on insufficient rations. Many had been in wet trenches for twenty-four hours on end; the temperature was usually 5 C. above freezing point. The gangrene was practically always symmetrical and affected the lower extremity in nearly all cases; the fingers were involved occasionally, but, as far as Page saw or could learn, never independently of the feet. The gangrene was usually dry, but in several of the more extensive instances it became moist, and there were several deaths from tetanus in this latter class of cases. When once the men were in the hospital the condition did not tend to advance except in the few instances in which emphysematous infection was superadded. Toxemia was not marked except under the latter circumstances. Page considers the condition to be strictly comparable to that of frostbite. The arterial circulation of the men affected was rendered extremely poor by the condition of starvation and fatigue; under these circumstances a temperature above freezing was able to produce stasis in the peripheral vessels. No doubt in some instances tight boots and puttees assisted, but many of the men affected had been wearing the loose native footwear. 5. Extensive gangrene of the extremities has been stated to occur in men after they have recovered from the effects of violent explosives. V. Berdisavljev, reporting from Servia, says he saw cases of hematuria, hemothorax, and shock as the result of explosions, but he says that in no instance did he see gangrene. Dr. Maclean had under his care in Constantinople a remarkable case of gangrene of all four extremities attributed to this cause. It will be appreciated that in general gangrene is merely an occasional complication of some other surgical condition, and that it only assumes epidemic importance under rare conditions of service.

4. Infection Following Elliot's Trephining Operation.—Griffith has trephined 125 times for primary glaucoma, by the method of Elliot, besides in a good many secondary glaucomas and for other diseases. He was well pleased with the results, and regards the operation as much more satisfactory than iridectomy in chronic glaucoma. A patient aged 55, had chronic glaucoma in both eyes. Both eyes were operated on within a short time of each other by upward trephining by Elliot's method, a small iridectomy including the pupillary margin being done, and the conjunctival flap was sutured. The patient was discharged in a month. Both eyes made perfect recovery and kept well for close on two years. He then presented himself with purulent iridocyclitis of the left eye. No light perception. Tension 3, exudation in the pupil, injection of the entire conjunctiva, edema of the lids, discoloration and inflammation of the iris; the pillars of the coloboma were free and well retracted. The eyeball was removed three days later. The eye had been affected four days. The other eye was still quite satisfactory in every way. The naked eye preparation of one-half the globe showed purulent cyclitis, the exudation covering the entire free surface of the ciliary body and posterior surface of the lens.

5. Causes of Blindness in Children.—The total number of blind and partially blind children from the blind schools of London brought by Harman into this inquiry is 1,100. The

causes responsible for their state of blindness may be placed in three groups: 1. Injury or destruction of the cornea consequent on surface inflammations. 2. Inflammation within the eyeball or optic nerve. 3. Congenital defects of the eyes. In the first group, injury or destruction of the cornea consequent on surface inflammations, ophthalmia neonatorum is responsible for by far the greater number of cases of blindness, and in particular for the cases of total blindness. The group contains 351 children, and the causes of the blindness are as follows: Ophthalmia neonatorum 266, 24 per cent., purulent conjunctivitis of later years 47, 4.2 per cent., phlyctenular keratitis 38, 3.4 per cent. The percentage for the grand total, 351, is 31.9 per cent.

The diagnosis of those cases marked "ophthalmia neonatorum," so far as the examination of the child at the time of school age is concerned, must rest on the character of the eye damage, the associated symptoms, and the history of the case as obtained from the parents or other responsible party. The cases of purulent conjunctivitis occurring in later months or years of child life were due to a great variety of causes. Eczema and streptococcal infections 4, scarlet fever 5, measles 10, German measles 1, meningitis 1, diphtheria 2, small-pox 4, erysipelas 1, chicken-pox 1, pneumonia 2, gonorrheal (contracted from vaginal discharge or pus from the eye of an affected baby) 2; total 47.

Group 2 contains a great variety of cases—inflammations of the cornea, of the iris, of the choroid and of the optic nerve; but it is sufficient for the purpose of these statistics to place them in two categories, according as the inflammation affected the anterior half of the eye or the posterior half. Those affecting the front half of the eye total 217, or 19.8 per cent.; by far the greater number are due to interstitial keratitis; there are a few only of iritis. Syphilis accounts for 17.8 per cent. Of those inflammations affecting the posterior half of the eye by far the greater number were due to a form of choroiditis known as "disseminated." This cannot be said to be diagnostic of syphilis, for other conditions are capable of causing the same or very similar conditions, but all evidence goes to prove that these cases are overwhelmingly syphilitic in origin. With the choroiditis there is always more or less atrophy of the retina and of the optic nerve, so that vision is gravely reduced. Closely associated with these cases are many cases of total optic atrophy. This group includes 222 cases, or 20.5 per cent. Of these, 126, or 56.7 per cent., were definitely syphilitic.

Group 3 includes 233 cases, or 21.2 per cent.; only 16, or 1.45 per cent., were known to be of syphilitic association. The figures show that there has been a definite diminution of the incidence of cases of blindness caused by ophthalmia neonatorum, and it is reasonable to credit this diminution to the great efforts that have been made to prevent the disease during the past few years. The apparent increase of the incidence of the cases of congenital syphilis is in part due to the diminution of the cases of ophthalmia, and in part to the use of finer methods of diagnosis. It is certain that the number of cases of blindness due to ophthalmia is diminishing both actually and relatively to the causes of blindness.

Journal of Tropical Medicine and Hygiene, London

August 15, XVII, No. 16, pp. 241-256

12 *Nitrogenous Metabolism in Chyluria. W. J. Young.

13 *Entamebiasis. Lim Boon Keng.

12. Nitrogenous Metabolism in Chyluria.—Young made a study of the albuminous matter and other nitrogenous constituents of the urine in two cases of chyluria. One case was that of a woman aged 42, otherwise healthy, who for twenty years had noticed that her urine became milky in appearance and clotted into jelly-like masses if left standing. She did not at first notice blood in the urine. Whereas formerly she had had no trouble on account of this, within the last ten years she had experienced dull, aching pains in the small of her back and had observed at times that the urine was stained with blood. On admission to the hospital specimens of blood taken both day and night were examined for filaria larvae, but it was never found to contain any.

The other patient was a miner aged 23. Eight years previous to admission he noted difficulty in passing urine and that it contained small, jelly-like, blood-stained clots, and also that the urine became milky on standing. He had dull, aching pains in his back. Otherwise the patient was quite well. Filaria larvae could not be found in the blood. Both were cases of true chyluria. The urines always contained fat which could be extracted with ether, but the milky appearance could not be entirely removed in this way. By the technic described by Young 1.8 per cent. of fat was found in the urine of Case 1 and 2.6 per cent. in that of Case 2. A quantity of protein was present which showed the properties of the proteins of the lymph. It coagulated when the urines were heated to 70 to 75 C., and contained globulin precipitated by half saturation with ammonium sulphate, and an albumin when the liquid was completely saturated with this salt. In Case 1 a fairly complete analysis of the nitrogenous constituents of the urine was made daily for fourteen days by a technic described in the article.

The patient whose weight, unfortunately, was not taken, was maintained on a diet consisting of lean meat, bread and potatoes, the nitrogen content of which was approximately 15 gm. The quantity of protein nitrogen excreted daily varied from 0.49 to 1.94 gm., the average for the fourteen days being 0.95 gm. per diem, corresponding approximately to 6 gm. protein. The complete results are given in a table, which shows a low grade of nitrogenous metabolism. The non-protein nitrogen representing protein actually utilized in metabolism was very small in quantity, the daily average excretion being 6.39 gm. This represents approximately 40 gm. protein catabolized. Aside from the protein nitrogen the other constituents of the urine showed a normally balanced nitrogenous metabolism.

In Case 2 the patient was kept on two different diets. During the first eight days the diet consisted of lean meat, eggs and bread carefully weighed out and equal in quantity to 15.4 gm. nitrogen per diem, while in the succeeding six days a diet of eggs, milk, bread and butter was employed. The daily quantity of urine varied from 1,120 c.c. to 3,195 c.c. The daily loss of lymph proteins as determined by the albumin in the urine averaged 2.40 gm. nitrogen, equivalent to 15 gm. protein. It varied from 10 gm. to 21.5 gm. The details are given in a table. During the first eight days the protein catabolized daily, as represented by the non-protein nitrogen, averaged 11.89 gm., approximately 74 gm. protein, which is about normal. The patient consumed the whole of the food given and did not find the amount excessive. During the second period, however, when the diet was controlled by the appetite of the patient, the quantity of nitrogen excreted decreased steadily, the non-protein nitrogen falling as low as 6.1 gm. daily, corresponding to only 38 gm. protein catabolized, a figure below normal. It was still decreasing when the experiment ceased.

13. Entamebiasis.—The relation of rheumatic pains, erythema and prurigo with dysentery and hepatic abscess, has been noted since the days of Graves and Murchison. Keng's observation is that all rheumatic inflammations and rheumatism as seen in Singapore, are associated with a protozoan organism, found in the intestinal canal in many persons, but mainly in those suffering from rheumatism, bronchitis, asthma, an irregular remittent fever, various inflammations, sciatica, lumbago, urticaria, erythema marginatum, erythema nodosum, prurigo, impetigo herpetiformis, lichen rubra acuminata, and chronic gastrodynia. One patient had painful micturition as if passing gravel, the urine being red and having a brick-dust deposit. In many of these patients, the organism is also found in the sputum, the urine, in the blood and in the skin eruptions.

It is Keng's impression that at least two distinct species (that producing dysentery, liver abscess and their inflammations; and that giving rise to rheumatism and its allies) may be clinically admitted although it is possible that in dysentery we have to deal only with a special phase of the multiplicative stage. This question of the relationship between dysentery and the rheumatic states cannot be settled. It is almost

impossible at times to say from microscopic examinations that the ameboid bodies found in endometritis, bronchopneumonia, and skin sinuses are not the *Entamoeba histolytica*. The different diseases named are often found in persons who have had an attack of dysentery, although the greater number of those rheumatic and gouty patients have never had dysentery.

The association of the parasite in its different stages with different diseases is as follows: I. Fungus-like plasmodium, constipation. (a) Few free amebas in the feces, flatulence, biliousness, hepatic congestion, headache, vertigo, dizziness, pyrosis, nervous symptoms, urticaria. (b) Granular ameba also present in sputum, pharyngeal irritation, colds and bronchitis. (c) Free ameba plentiful in feces, sputum and blood, rheumatism, with arthritis and heart disease, toxemia, typhomalarial type of fever, acute urticaria, prurigo, boils, etc., tonsillitis, sciatica and gravel. II. Multiplicative phase. Large granular ameba undergoing fission, schizogony and budding by means of chromidia shedding, acute dysentery, acute gastritis and colitis, bronchopneumonia, bronchiectasis and phthisis, adenitis metritis and pelvic abscess, peritonitis, nephritis, appendicitis, hepatic abscess, pyemia. III. Encysted stage. Recovery for the time being or improvement in the patient's condition. Relapse occurs when the cysts burst and the parasites resume the active rôle. IV. Parasites in all stages flourish in the blood in extensive areas and affect the kidneys, with cachexia, anasarca, anemia, debility, sweats.

As far as Keng can make out the parasite is a mycetozoon and is a form of chlamydomysca. The fungus stage closely resembles a mycetozoa which he has found in house drains and is almost indistinguishable from a parasite in the intestinal canal of fowls. Provisionally, we may call it *Chlamydomysca toxifera* on account of its toxic effect on man.

Lancet, London

August 29, II, No. 4748, pp. 537-616

- 14 General Council of Medical Education and Registration of United Kingdom. Powers and Duties of General Medical Council.
- 15 Medical Examining Bodies and Schools of United Kingdom.

Sei-I-Kwai Medical Journal, Tokyo

August, XXXIII, No. 8, pp. 45-51

- 16 Some Facts in Acute Appendicitis. Y. Takaki.

Annales de Médecine, Paris

July, II, No. 1, pp. 1-106

- 17 *Habit of Swallowing Aerated Saliva. (Sialophagie.) G. Hayem.
- 18 *Reinfection with Tuberculosis. III. (La réinfection cutanée et le phénomène de Koch.) E. Rist and J. Rolland.
- 19 Hereditary Malformation of Chin and Nose with Exophthalmos and Strabismus. (La dysostose cranio-faciale héréditaire.) C. Chatelin.
- 20 The Reaction of the Bone Marrow in Tuberculous Anemia. A. Cain.
- 21 Eosinophilia in the Diatheses and in Conditions Suggesting Anaphylaxis. F. Bezançon and R. Moreau.

17. Habitual Swallowing of Aerated Saliva.—Hayem regards this as a form of aerophagia and as by far the most common type. This sialophagia should be suspected, he says, in every case of gastro-intestinal tympany. Auscultation over the stomach will generally reveal the gas entering and leaving the stomach, and sometimes the gas can be heard in the stomach. The sound more frequently heard from it is a borborygmus as the aerated saliva enters the stomach from the esophagus. He regards this sialophagia as a reflex act from some abdominal organ and suggests that it may reveal something wrong in this organ, especially if it happens to be the stomach, before any other signs point to it.

18. Reinfection with Tuberculosis.—The extensive experimental work here reported was for the purpose of studying the reaction of the skin of tuberculous guinea-pigs to reinfection with large doses. Special attention was paid to the histologic aspect of the reinoculation lesions and the behavior of the tubercle bacilli in them. When the reinoculated guinea-pig was under the influence of preexisting tuberculosis, the reinfection manifested itself always as an acute hemorrhagic inflammation with necrosis. The lesion appears

in twenty-four hours instead of the incubation of from eight to twelve days with a primary inoculation. The lesion also heals completely sooner or later, thus differing from the incurable skin lesion of a primary infection. In the reinoculation lesion the tubercle bacilli all die off in time. These differences from the behavior of a primary skin lesion confirm the assumption of a state of allergy.

Annales de Médecine et Chirurgie Infantiles, Paris

August 1, XVIII, No. 15, pp. 501-536

- 22 Infants and City Noises. (Les inconvénients du bruit. Comment en préserver nos petits malades?) E. Périer.
- 23 Perforation of the Appendix. J. Roux.

Deutsche Zeitschrift für Chirurgie, Leipzig

July, CXXX, Nos. 3-4, pp. 325-332

- 24 *Primary Sarcoma of the Pelvis. (Beckenknochenarkome.) M. Schmideder.
- 25 Experimental Research on Suppurative Parotitis. E. Rost.
- 26 Operative Treatment of Dislocation of the Talus. W. Schmitt.
- 27 Bone from Gall Stones. A. Wagner.
- 28 Abnormal Location of the Appendix. A. Troell.
- 29 Operative Treatment of Acute Gastric Hemorrhage. G. Alberts.
- 30 Torsion of Colon, Movable Cecum and Ileus. R. Ingebrigtsen.
- 31 Retrosternal Dislocation of the Clavicle. Hachner.

24. Sarcoma of the Pelvis.—Schmideder devotes nearly a hundred pages to summaries of 178 cases from the literature of sarcoma in the bones of the pelvis, and adds a detailed account of another case from his own practice. In most of the cases the favorable moment for operative treatment had been allowed to pass.

Medizinische Klinik, Berlin

August 2, X, No. 31, pp. 1299-1344

- 32 *Surgical Treatment of Cavities in the Lungs. P. Frangenheim.
- 33 Pathology of Ileus. E. Fritzsche and E. Stierlin.
- 34 Effectual Action of a Swiss Sulphur Mineral Water in Rebellious Eczema, Acne, and as Adjuvant for Surgical Bone and Joint Disease. (Zur Wirkung der Schwefeltherme von Schinznach.) E. Bischer.
- 35 *The Seashore and Cardiovascular Disease. (Zur Prognose der Herz- und Gefäßerkrankheiten.) M. Bockhorn.
- 36 Acromegaly Plus Splanchnomegaly with Hypophysis Tumor in Male Cadaver of 32. Eltester.
- 37 Failure of Attempts to Record Pulse in Aorta. H. Bergmann.
- 38 *Mechanism of Attack of Asthma. (Ist es gerechtfertigt, als Ursache des bronchialasthmatischen Anfalls eine Verengung der feineren Luftwege, sei es in Form eines Bronchospasmus, sei es in Form von Schleimhautschwellung anzunehmen.) Winter.

32. Surgical Treatment of Cavity in the Lung.—Frangenheim regards operative treatment as indispensable for a cavity in the apex if it persists little if any modified after all the other tuberculous processes in the lungs have healed. Baer has reported success from surgical treatment of cavities in both lungs. The chances are better when the sheets of the pleura are adherent, but a cavity in the apex with open pleural cavity does not absolutely contra-indicate intervention. With a very large and thin-walled cavity, there is danger of the wall's suffering from inadequate blood-supply. Roentgenoscopy and the exploring finger warn of this. In treatment of a cavity in the upper lobe, he insists that pneumolysis offers better chances than operations on the chest wall. By "pneumolysis" he means operative mobilization of the upper lobe after the cavity has been emptied by gravity, the patient reclining on his side for an hour. A stretch of a few centimeters is resected from the second or third rib in front and, through a lengthwise incision in the periosteum behind, the finger is worked through between the fascia and the costal pleura and the upper lobe is loosened up all around to correspond to the extent of the cavity. An opiate before the operation prevents reflex phenomena and the whole operation can be done under local anesthesia, dabbing the pleura with the anesthetic solution. He has never had any hemorrhage worth mentioning.

When the part of the lung with the cavity is thus mobilized, the cavity may be obliterated by compression from a paraffin or other filling injected between the pleura and the chest wall. Various drawbacks have been encountered with different fillings; paraffin is so heavy it is liable to slide down below the cavity. It has also been known to work its way outward

through the breach in the ribs and entail a suppurating fistula. Friction from the paraffin has also caused gangrene of lung tissue in some instances. Compression of the lung by an inflatable bag introduced into the extrapleural space is liable to lead to infection. Wilms uses fat tissue as the filling, and this seems the best of all for the purpose, provided it is not too rapidly absorbed. Mayer insists that the pneumolysis alone, without any filling, is all that is necessary at first. Later, if the lung shows a tendency to expand and open up the cavity again, nitrogen could be injected to fill the space. Both Wilms and Baer insist that the filling procedure need not be restricted to old, chronic, shriveling cases, but can be applied in a recent process with cavities: there need be no fear that the procedure in itself will aggravate the tuberculosis. The cavity is influenced by the pneumolysis much more than by a thoracoplastic operation, while the heart, the lungs elsewhere and the muscles controlling expectoration are not impaired by it. When the technic for filling the extrapleural space is further perfected, the pneumolysis method will certainly be found extremely valuable for treatment of cavities in the lungs, especially in the upper lobe, while with diffuse pulmonary disease extensive thoracoplastics answers the purpose better.

35. Prognosis of Cardiovascular Disease.—Among the points emphasized by Bockhorn is that the heart and the vascular system are one, as is evident from the embryonal development. Thus what acts on the peripheral circulation acts on the heart as well. He refers in particular to the effect of sea bathing and sea air, saying that he knows of far more people living to 90 and over in good health in seashore towns than in the inland, other conditions approximately equal. Neurasthenics should be sent systematically to the seashore for a course of training; if this were done regularly, cardiovascular disease might be warded off in a large proportion of cases. In arteriosclerosis, the process might be arrested and other vascular regions saved from involvement if there were seashore sanatoriums and convalescent homes available. Bockhorn states that tests have shown that the North-Sea bathing represents a course of cold, carbonated, brine baths and such are regarded by many as the most effectual form of balneotherapy in treatment and in prophylaxis of cardiovascular disease.

38. Mechanism of Asthma.—Winter ascribes the attack in asthma to some irritation of the vagus; this causes, by reflex action, some disturbance in the blood-vessels in the lungs. The blood-vessels become enlarged and more easily permeable, and this readily explains the symptoms observed.

Münchener medizinische Wochenschrift, Berlin

July 28, LXI, No. 30, pp. 1657-1712

- 39 Corpus-Luteum Preparation in Treatment of Irregular Menstruation. L. Seitz, H. Wintz and L. Fingerhut. Concluded in No. 31.
- 40 *The Fat Acids and Coagulation of the Blood. (Chemische Erklärung des Gerinnungsvorganges.) B. Stuber and R. Heim.
- 41 *Serodiagnosis of Pregnancy. (Weitere Erfahrungen mit der Abderhaldenschen Reaktion allein und im Vergleich mit der Antitrypsin Methode.) R. Freund and C. Brahm. (Zur S:bstfrage bei der Anwendung des Abderhaldenschen Dialysierverfahrens.) P. Lindig.
- 42 *Colorimetric Determination of the Sugar in the Blood. (Ueber kolorimetrische Bestimmungsmethoden; IX.) W. Autenrieth and W. Montigny.
- 43 *The Tuning Fork-Stethoscope Method. (Zur Stimmgabel-Stethoskop-Methode.) Olpp.
- 44 *Gunshot Wounds of the Heart. (Zur operativen Behandlung der Herzschüsse.) T. Müller.
- 45 Restoration of the Ear. (2 Auropplastiken.) E. Eitner.
- 46 *Infectious Erythema. A. Heisler.
- 47 *Serodiagnosis and Differentiation of Cancer. M. Weinberg. Commenced in No. 29.
- 48 The Disadvantages of the Constantly Increasing Cost of Building and Running Public and Private Sanatoriums. (Der Nachteil der dauernd steigenden Anlage- und Betriebskosten von Sanatorien.) C. Schütze.

40. The Chemistry of the Coagulation of the Blood.—Stuber and Heim have continued their research on the influence of lipoids on various biologic processes, on phagocytosis and coagulation, and here report that there is a direct connection between the fat-splitting and the coagulation-inducing

properties of ferments. Steapsin proved the most active in both lines. Chemically pure stearic acid, and tristearin in a lesser degree, are able to induce coagulation of the blood as promptly as or even more effectually than thrombokinase. In respect to their influence on the coagulation of the blood, the fat acids can be classified in a homologous series, their place in which is determined by the number of carbon atoms in the molecule. The arrest of coagulation by leech extract comes under the workings of this law. The first phase of the coagulation process is thus a lime-fat soap production; the second phase is the lime-fat soap fibrinogen, the lipolytic ferment serving as catalyzer. The latter—blood-lipase—seems to be under the control of certain glands with an internal secretion.

41. Serodiagnosis of Pregnancy.—Freund and Brahm report the application of Abderhalden's technic in 114 pregnant women and in 36 controls, men and non-pregnant women. The test gave negative findings in 18.4 per cent. of the pregnant women and a positive reaction was obtained in 53.1 per cent. of the men and the non-pregnant women. Thus the test failed in nearly 27 per cent. of 135 cases. They report further some additional series showing equally disappointing results with various modifications of the technic. They applied the antitrypsin method along with the Abderhalden in 48 pregnant and 16 non-pregnant women, or in men, and incorrect responses were obtained once with the antitrypsin method and seven times with the Abderhalden among the pregnant, and seven times with the former and ten times with the latter among the controls, including some normal or syphilitic men. Neither test proved absolutely reliable, but the antitrypsin test was much more so than the Abderhalden while its technic is simplicity itself in comparison, especially E. Rosenthal's modification of the original Fuld-Gross method. Heimann and Chotzen obtained correct responses with it in all of 66 controls and in 47 of 50 pregnant women, and R. Franz's tests of 223 pregnant women have confirmed the value of the test; a negative reaction may be accepted as positively excluding pregnancy. Franz remarks, however, that as the test is merely a sign of increased metabolism of albumin and is not specific for pregnancy, a positive response must not be regarded as a sign of pregnancy unless it is possible to exclude other conditions accompanied by augmented destruction of albumin, such as cancer, tuberculosis, nephritis, exophthalmic goiter and fever from any cause. . . . Lindig uses desiccated and pulverized placentas for the test, or casein in substance.

42. Colorimetric Determination of the Sugar in the Blood.—With the technic described the sugar content in normal adult males ranged from 0.05 to 0.07 per cent. A diabetic with 6.2 per cent. sugar in the urine had 0.2 per cent. sugar in the blood. In four healthy infants the sugar content ranged from 0.029 to 0.036 per cent. In order to obtain comparable findings, Autenrieth and Montigny emphasize the importance of agreeing on a standard test meal and standard interval before applying the test, as food containing much sugar, such as honey, increases materially the percentage of the sugar in the blood.

43. The Tuning Fork-Stethoscope Method.—Olpp commends Cantlie's method of using the tuning fork in connection with the stethoscope to determine the outline of the viscera, of tumors, etc. The method can be applied to one's own body. Gynecologists may find that this method will reveal a tumor in the uterus or elsewhere that escapes all other methods of investigation.

44. Operative Treatment of Stab and Gunshot Wounds of the Heart.—Müller relates an instance of an apparently insignificant wound of the heart which entailed fatal internal hemorrhage while another, much more serious apparently and sutured at once, terminated in recovery. The bullet was not found in the latter case and still can be seen with the Roentgen rays about two finger-breadths above the diaphragm. The heart was sutured with catgut in this case and the young man has been apparently in perfect health during the months since. In this as in most of the cases on record

the bullet hole through the soft parts suppurated but the inflammation did not extend below. Recovery is known in 53 per cent. of 51 operative cases on record; in the latest 10 cases, 9 of the patients were cured. Müller's other patient was a girl of 10 who fell on a glass roof and cut herself slightly at several points. The quarter-inch cut in the third left interspace was not considered serious at first but an operation two hours later revealed a glass splinter which had cut the left ventricle. The 1-cm. wound was sutured with silk and the heart-beat grew stronger at once but the child had lost so much blood that she was unable to rally and died in two and a half hours after the operation. The sharp splinter of glass had struck the third rib and been deflected into the left ventricle.

46. **Infectious Erythema.**—Heisler reports an epidemic of this affection last spring embracing twenty-five cases. It sometimes came on with a stormy onset, fever and glandular enlargement accompanying the maculapapulous erythema on the cheeks, possibly becoming confluent and giving the face a peculiar bloated appearance. The color of the erythema was a bluish red; in a day or so it extended down on the upper arms and toward the back of the neck and shoulder-blades. The second or third day the buttocks and outside of the thighs developed the erythema likewise, but nowhere was it confluent except on the face. The eruption is briefly transient and sometimes comes and goes and returns, all with equal suddenness. No connection with any other infectious disease was apparent in his experience. The epidemic broke out first in a boys' boarding school in the middle of a term. The incubation period was from five to fourteen days, generally seven, and direct transmission from child to child could be traced in each new case. The swollen region in the face generally showed some desquamation later and there was a tendency to pigmentation in a few cases. The spleen was not enlarged in any instance and the urine was normal except for the presence of indican in a few cases. The fleeting nature of the erythema aided in differentiation but the most characteristic finding was the sudden enlargement of the glands below the ear and toward the occiput. This preceded by a day or so the erythema.

47. **Serodiagnosis of Cancer.**—Weinberg gives the details of 12 cases in which malignant disease seemed certain but the Abderhalden test gave negative findings, and the further course of the cases disproved cancer. In 28 cases of cancer the test was positive in all but 2 and in one of these the cancer had developed so suddenly and actively that possibly there had not been time for the specific ferments to develop. In 15 controls the reaction was constantly negative. Contrary to the experiences related by others, Weinberg found that carcinoma serum digested carcinoma-tissue alone, and sarcoma serum, sarcoma-tissue alone; the special organ involved seemed immaterial. The specific tissue is the main point; spindle-celled sarcoma would not respond to round-celled and vice versa, and the same occurred with cylinder-celled carcinoma, etc. Lack of realization of this peculiar specificity may explain the conflicting experiences published by some workers in this line. In 8 cases the reaction persisted positive after the removal of the cancer and in each instance this was explained by the discovery of metastases.

Wiener klinische Wochenschrift, Vienna

July 30, XXVII, No. 31, pp. 1133-1174

49. "Vaccination Technic for Tuberculin Treatment of Tuberculosis. (Neuere Verfahren der Tuberkulosebehandlung und die für Pathologie und Therapie daraus zu ziehenden Schlüsse.) H. Weichert. Concluded in No. 32.
50. "Technic to Exclude Disturbing Elements in Electrocardiography. (Methode, die physikalischen Einflüsse auf die Form der Elektrokardiogramme auszuschalten.) K. Mayer.
51. "Intramuscular Injections of Blood in Treatment of Leukemia. G. Kiralyfi.
52. Retention Tumor in Parotid Gland. (Speicheldrüsengeschwulst.) V. Lazarevic.
53. Quarantine Regulations in the United States. E. Weiner. August 13, No. 33, pp. 1207-1226
54. "Neosalvarsanized Serum in Treatment of Syphilis of the Nervous System. Gurari.

55. Isolated Fracture of the Semilunar Bone. (Mondbeinfaktur.) A. Plunger.
56. Durable Collargol Preparations of Spirochetes, etc. (Herstellung der haltbaren Kollargolpräparate von Spirochäten und Hyphomyzeten.) J. Saphier.

49. **Vaccination Treatment of Tuberculosis.**—Weichert explains on the basis of the side-chain theory Piondoff's success in treating tuberculosis by systematically repeated vaccination—like an intensified Pirquet tuberculin test, repeated about once a month. He assumes that the skin and mucous membrane are the seat of especially vigorous antibody production as they bear throughout life the brunt of bacterial attacks. Other arguments to sustain this assumption are presented, including the success of vaccination against small-pox. The article is continued.

50. **Improved Technic for Electrocardiography.**—With the ordinary technic one never knows from what part of the heart the electric current is proceeding, and hence it is impossible to obtain records under exactly similar conditions for comparison with other cases or even with other records of the same organ. Mayer says that he has overcome this difficulty by taking the record as the patient reclines in a zinc tub filled to a certain mark with water. The volume of the body plus the water is thus always the same, and the area of conduction is so large and so far from the heart that minor differences become equalized.

51. **Injections of Blood in Leukemia.**—Kiralyfi calls attention to the stimulating effect on the bone-marrow of intramuscular injections of defibrinated blood when the patient has been taking benzol or Roentgen treatment to excess; that is, when the benefit apparently being realized from the treatment suddenly gives place to an acute exacerbation, which is a frequent occurrence. In a case reported in detail, a merchant of 59 with myeloid leukemia for about six months improved after six days of benzol treatment, the whites dropping from 31,000 to 13,000, and the benzol was discontinued. The whites continued to drop until they numbered only 2,150 and the reds dropped to 1,000,000 and the patient suffered intense pains in his limbs. A venesection had just been done to relieve a patient with polycythemia, and 10 c.c. of the blood drawn from this patient was injected into the gluteal muscle of the leukemia patient. By the next day the whites had climbed to 7,000 and by the fourth day to 11,900 and the reds numbered 150,000 more, showing that the exhausted bone-marrow had begun to recuperate. The injection was repeated with ordinary blood nine days and again three weeks later, and the improvement continued. The complexion became natural, the swollen glands subsided, and the previously bed-ridden patient was able to be up and about. The reds have kept since at about 2,000,000 and the whites from 9,000 to 10,000.

54. **Treatment of Syphilis of the Nervous System.**—Gurari has been applying Swift and Ellis' technic and later a modification of it and reports considerable improvement in a number of the cases. Ten are described in detail with the findings on repeated lumbar puncture. He makes an intravenous injection of neosalvarsan and an hour later draws the blood, but instead of aspirating it he introduces the needle alone into the vein after a constricting band above has been drawn tight. Then the band is removed and the patient works his fingers, the forearm pendent. Blood then pours out of the needle almost as if it came from an artery; the blood is received in a glass vessel with a broad bottom. It is set aside for twenty-four hours, when the serum is ready for use, clear and without a trace of hemolysis. He has applied this procedure forty-five times, estimating the results by the chemical, histologic and serologic findings in the cerebrospinal fluid as the criteria. In six of the ten cases reported in detail the pleocytosis was materially reduced; in three nearly to normal with one injection, in the others not until the second or third injection. The Nonne reaction subsided also parallel to the pleocytosis. The Lange and Wassermann were the hardest to influence, especially the Lange. It persisted in some cases after five injections, long after the Wassermann had disappeared. The clinical course

showed improvement in the subjective symptoms, the pains and other sensory disturbances, but the symptoms from the far-advanced anatomic changes naturally were not influenced.

Zentralblatt für Chirurgie, Leipzig

August 8, XLI, No. 32, pp. 1313-1352

- 57 Resection of Cardial Section of Esophagus for Cancer. W. Meyer (N. Y.).
- 58 Access to Thoracic Esophagus. (Zur Freilegung des Brustabschnittes der Speiseröhre. R. Wilmanns.
August 15, No. 33, pp. 1353-1384, and Supplement, pp. 1-112
- 59 *Technic for Pyelography. A. V. Lichtenberg.
- 60 Technic for Correction of Double Harelip. (Doppelseitige Hasenscharte.) H. Hans.
- 61 Transactions of XLIII Annual Meeting German Surg. Ass'n.

59. **Technic for Pyelography.**—Lichtenberg says that he has applied pyelography about a thousand times and this experience has confirmed the necessity for preliminary thorough purging, also the advantage of using a catheter impregnated with bismuth in certain segments alternating regularly with non-opaque segments. This permits distances to be readily estimated. The larger the supposed dilatation of the kidney pelvis, the longer must be the delay before injecting any fluid. With hydronephrosis, even in its incipient stage, there may be obstruction to the reflux of the fluid injected and a typical attack of colic may ensue. After a few hours or days the fluid injected may be emitted with urine at intervals, this keeping up for eight or ten days. He has observed intervals up to two and a half days. This intermittent stoppage, as shown by pyelography under the Roentgen rays, is an absolutely reliable sign of latent incipient hydronephrosis, according to his experience. The fluid injected is also liable to be retained in cavities and ulcers; he regards this as an advantage rather than otherwise, as the silver salt he injects for the pyelography exerts a direct healing influence. If the mucosa is sound it is smooth and the injected fluid rapidly reaccumulates in the bladder. He warns that pyelography is contra-indicated if there is hemorrhage.

Zentralblatt für Gynäkologie, Leipzig

August 8, XXXVIII, No. 32, pp. 1121-1152

- 62 Mesothorium in Treatment of Uterine and Vaginal Cancer. B. Schweitzer.
- 63 Radiotherapy for Chorio-Epithelioma. A. Hörmann.
- 64 Danger of Roentgen Rays from Standpoint of Eugenics. (Röntgenstrahlen und Eugenetik.) M. Hirsch.
August 15, No. 33, pp. 1153-1184
- 65 Means for Control of Sponges at Gynecologic Laparotomies. (Tupferkontrolle.) G. Schubert.
- 66 Waterproof Permanent Dressing for Umbilicus. (Ein wasserdichter Nabeldauerverband für Neugeborene.) C. Holste.
- 67 Decidua Responsible for Pregnancy Seroreaction. (Die innere Sekretion der Decidua im Hinblick auf die Arbeit von J. Schottländer: "Zur Theorie der Abderhalden'schen Schwangerschaftsreaktion usw.") A. Gentili.

Gazzetta degli Ospedali e delle Cliniche, Milan

August 4, XXXV, No. 93, pp. 977-984

- 68 Fracture of Sternum. A. Balduzzi.
August 6, No. 94, pp. 985-992
- 69 *Fats in the Sputum. (Ricerche microchimiche sulle sostanze grasse dell'espettorato in condizioni normali e nella tubercolosi polmonare.) N. Barbaro.

69. **Fatty Substances in the Sputum.**—Barbaro found a decided increase above the normal proportion of the fatty substances and lipoids in the sputum with pulmonary tuberculosis. The increase was greater the more advanced the tuberculous process.

Polliclinico, Rome

August 2, XXI, No. 31, pp. 1109-1144

- 70 *Vaccine Therapy of Typhoid. II. V. Pensuti.

70. **Vaccine Therapy of Typhoid.**—Pensuti states that relapses occurred in 25 per cent. of thirty-seven cases of typhoid in which antityphoid vaccine had been applied in treatment. He theorizes to explain this enhanced tendency to relapse, and reports a series of thirty-one new cases in which the vaccine was given by another technic, based on the theory he advances. He injected the usual therapeutic dose

and then continued with minute doses, keeping this up even for a few days after the temperature had returned to normal. The injections even of the minute doses were followed each by a brief rise, demonstrating the instability of the defensive forces, but they evidently reenforced them as recovery proceeded smoothly and there were no relapses in the entire series.

Brazil-Medico, Rio de Janeiro

July 15, XXVIII, No. 27, pp. 259-266

- 71 Operations on the Lacrimal Duct. (Operação de Toti e operação de West. E. Campos. Commenced in No. 26.
July 22, No. 28, pp. 269-278
- 72 Colitis Due to Chilomastix Mesnili; Five Cases. A. M. da Cunha and M. Torres.
- 73 *Isolated Right Ophthalmoplegia of Malarial Origin. (Caso de nevrite do motor-ocular commum e do pathetico de origem palustre.) A. Britto.

August 1, No. 29, pp. 279-286

- 74 *Atypical Rabies. (Caso atypico de raiva humana.) J. Micieli and U. Paranhos.

August 8, No. 30, pp. 287-296

- 75 *Case of Gynecomastia. C. Werneck.

73. **Neuritis of Malarial Origin.**—Britto's patient was a young man with paralysis of the nerves innervating the muscles of the right eye. There was a history of mild venereal disease but the blood contained the malaria germ and under quinin the ophthalmoplegia promptly subsided. Without microscopic examination of the blood the true cause of the trouble would scarcely have been suspected.

74. **Atypical Rabies.**—In the case reported a man of 60 developed symptoms which suggested rabies at first but they soon subsided and he seemed calm and cheerful and took baths and his meals normally, and the diagnosis was changed to incipient general paralysis. The fifth day the patient was found depressed and apathetic, with paralysis of the legs, and he died in a few hours. The necropsy findings proved the case to have been true rabies beyond question, but the man had never been bitten by any animal. He had told, however, that a few months before he had hurt his leg slightly and an old dog of his had licked the small sore and the dog had disappeared not long afterward.

75. **Case of Gynecomastia.**—Werneck says that in the case illustrated, the abnormal development of the mammary glands in a mentally backward young man was evidently secondary to atrophy of the testicles and cryptorchidism. The low blood-pressure and readiness to fatigue indicate insufficiency of the adrenals.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

May 30, LVIII, No. 22, pp. 1845-2044

- 76 *Arguments Why the Practice of Medicine Should be Restricted to Those Trained in Medical Science. (Arztenmonopolie en Geneesvrijheid.) C. A. Pekelharing, H. Treub and Others.

76. **Arguments for Safeguarding the Practice of Medicine.**—A movement is on foot in the Netherlands the aim of which is to throw down all the barriers that now protect the sick against ignorance and unscrupulous exploitation. The 200 pages of this issue of the *Tijdschrift* are devoted entirely to a survey of the value and necessity of the present safeguards, twenty-six leading physicians considering the subject from different standpoints, the whole forming an able protest against any letting down of the bars. B. J. Polenaar, a lawyer, tells of the numerous and far-reaching changes that would have to be made in the present laws to protect the public health and the sick in case the practice of medicine were to be thrown open to all. J. Slingenberg reviews the legislation in various countries in turn which regulate the practice of medicine; Germany and England, he says, are the only civilized countries which do not require a medical degree, and in Prussia alone the number of the untrained dealing in the healing art has risen from 2,404 in 1898 to 6,137 in 1905. C. A. Pekelharing traces the history of medicine from ancient days to the present, showing how superstition and mysticism have always hampered the progress of medical science and how strict science alone can be the basis for suitable treatment. C. Winkler shows that the

history of medicine seems to be a chain of errors and yet how at every point there is evidence that relative truth has emerged from the errors. Empiricism leads the way and scientific medicine follows. H. Treub, in an extremely interesting analysis of the differences between the charlatan and the trained physician, compares the untrained practitioner of medicine to a blind man stumbling around in a dark room seeking something he does not know what; while the scientific physician is like a normal man in a well lighted room seeking an object with which he is familiar.

The standing of physicians and the practice of medicine in ancient Greece and Rome and in the middle ages are discussed by K. Kuiper, J. W. Beck and M. A. van Andel. The charlatan as portrayed on the stage in the Netherlands and in Dutch literature is described by J. te Winkel while G. van Rijnberk tells of the quack in Dutch art, reproducing several engravings; he discusses further modern "miracle cures," hypnotism and magnetism. P. Muntendam depicts the harm done by books for home doctoring, written in a popular style, of which Germany has so many. He remarks that even those written by physicians have their disadvantages, but it is difficult to overestimate the harm done by the books of a Bilz, a Kuhne or other quacks.

The methods of various quacks and cults are described in a number of articles, H. U. Meyboom writing of Christian Science and the Emmanuel Movement, J. Stärcke of Amsterdam telling of the absurd and dangerous practices of many exponents of the drugless school. Household and folklore remedies are discussed by E. C. van Leersum and P. van der Wielen. Homeopathy and its erroneous conception of the action of drugs are discussed by H. Pinkhof of Amsterdam, and the dangers which would confront the public if the practice of medicine was not safeguarded are described by several writers. The way in which infectious diseases would spread and cancer progress unchecked if the movement for throwing open the practice of medicine to the untrained should succeed, are well shown by H. G. Ringeling and S. Mendes da Costa of Amsterdam. The latter emphasizes this in particular for venereal diseases and J. Rotgans for cancer. The harm that would be done to the public health, to social medicine and to social hygiene by removing restrictions to the practice of medicine is shown well by J. G. Sleeswijk, professor of hygiene at the University of Delft. The waste of money from quack practices is reviewed by E. J. Abrahams, who remarks that it is impossible to estimate the sums squandered for worthless or sometimes dangerous quack remedies, but he knows that quacks pay annually at least 800,000 florins for their advertisements in the papers and periodicals of the Netherlands. W. Nolen of Leyden reviews some of the latest achievements of medicine and comments on some of the disappointments it has encountered in recent years, and suggests new lines for further conquests. H. Schreve, medical director of the Rotterdam public hospital, concludes the series with instances of serious injury from the procedures of the naturopaths.

The issue closes with a book-review department, reviewing a number of new German and Holland works bearing on quackery and its menace to public health. The pamphlets issued by the leaders of a similar agitation in Germany are also analyzed and answered point by point.

Mitteilungen a. d. kais. Universität, Tokyo

April, XI, No. 3, pp. 309-494, German Edition. Last indexed May 30, 1914, p. 1765

- 77 Localization of Function in the Spinal Cord for Muscles of Hand, Leg and Diaphragm. J. Shimazono.
- 78 *Pathologic-Histologic Findings in the Nervous System with Beriberi. K. Honda.
- 79 Subacute Macrophocyte Leukemia; Only Transient Improvement Under Roentgen Treatment. S. Okada.
- 80 Embryologic-Anatomic Study of the Stria Vascularis of the Cochlea. (Stria Vascularis der Gehörschnecke.) T. Wada.
- 81 Congested Veins in the Back, etc., with Impeded Circulation in Inferior Vena Cava. S. Nukada.

78. The Changes in the Nervous System with Beriberi.—Honda gives some colored plates of the pathologic-histologic findings in a number of cases of beriberi emphasizing the

characteristic and constant changes as they occur in both the central and the peripheral nervous systems. The pathologic findings are less pronounced in the peripheral nerves with acute than with chronic beriberi, but the extent of the nerves involved as a whole is greater than with the chronic form. He defines the acute form as that in which the nerves of more vital importance, the phrenic and vagus nerves and the nerves of the extremities are affected early and with great intensity. In the chronic cases the less vitally important nerves are affected early and intensely but those of great vital importance escape entirely or nearly entirely. In two infants with beriberi the changes in the nerves corresponded more to those of the acute form in adults although the clinical picture was more like that of the adult chronic type. Honda applies the Bielschowsky technic to specimens embedded in celloidin, and thinks that this modification of the otherwise ideal Bielschowsky technic is a great improvement. The specimen is not loose and can thus be easily handled; different stains can be applied to the same specimen, and mechanical injury in cutting frozen sections is done away with. He discusses the history of work on the nerves in beriberi and reviews the literature, tabulating the details of the histologic findings in his twenty-six cases.

Russky Vrach, St. Petersburg

April 12, XIII, No. 15, pp. 525-560

- 82 *Indications and Technic for Operative Treatment of Uterine Cancer. N. M. Kakushkin.
- 83 *Injury of Vagus in Operations on the Neck. T. K. Weber.
- 84 *Potassium Iodid Test for Differentiation of Cancer and in Treatment. M. P. Mikhailoff.
- 85 *Bacillus of Fish Poisoning. (Bac. ichthyismi.) S. V. Konstansoff.
April 19, No. 16, pp. 561-596
- 86 *Total Laryngectomy for Cancer. W. M. Mintz.
- 87 Gumma in Trachea Revealed by Tracheoscopy; Recovery Under Specific Treatment Plus Stretching the Stenosis. A. M. Nikolsky.
- 88 Paroxysmal Tachycardia. V. P. Simonovitch. Commenced in No. 15.
April 26, No. 17, pp. 597-632
- 89 Fat Embolism during Orthopedic Operations. G. I. Turner.
- 90 *Muscle Sign of Chronic Appendicitis. N. M. Volkovitch.
- 91 Influence of Bile Salts in Blood on the Vascularization of Organs. E. A. Kartashevsky.
- 92 Technic for Making Artificial Eyes. R. A. Katz.
- 93 Technic for Staining Negri Bodies. S. P. Kotzevaloff.

82. Uterine Cancer.—This and some other articles in this issue were read at the first general meeting of the All-Russian Association for the Campaign against Cancer. Kakushkin thinks that both the abdominal and the vaginal routes have their indications. The latter is best for incipient cases and when the body of the uterus is involved. The abdominal method should be preferred when there is parametritis with adhesions, and then the transverse incision is desirable. He advises hysterectomy even for benign hyperplasia of the cervix and erosions in prophylaxis of cancer.

83. Dangers of Injuring the Vagus in Operations on Tumors in the Neck.—Weber reports five cases to show the serious dangers liable from reflex action when the vagus is injured in operations on the neck, and cites Reich's compilation of forty-four cases with five deaths. For these reasons he urges the importance of blocking the nerve with a 20 per cent. cocaine solution, above and below the tumor, to ward off trouble if it should happen to be injured. One of Weber's five patients succumbed half an hour after the operation. The others recovered but one was left with paresis for a time.

84. Potassium Iodid in Diagnosis and Treatment of Cancer.—Mikhailoff strongly recommends potassium iodid in internal cancer, preferably in the form of rectal injections (4 gm. potassium iodid; 2 gm. sodium carbonate and 80 or 100 c.c. distilled water). This he supplements with 1 per cent. solution of sodium arsenate (sodium arsenici) hypodermically, which solution must be made with 0.25 per cent. phenol. He found that if the temperature rises one or two hours after the rectal injection of the potassium iodid, then we positively have to do with a malignant growth (carcinoma or sarcoma). If the temperature remains stationary or even declines, then cancer can be excluded and syphilis is probable. He sees in

the action of potassium iodid in this respect an analogy to the action of tuberculin in tuberculosis, and claims that carcinoma can be cured in certain stages of malignant disease with this method of treatment. It reveals the presence of cancer like the positive response to the tuberculin test in tuberculosis, and a systematic course of treatment with it has a curative influence like that of tuberculin.

He states that potassium iodid seems to display a special affinity for cancer cells in the test-tube, and his clinical experience apparently indicates that this is the case also in the human body. For the differential diagnosis, he gives the rectal injection as above described, and repeats it after an hour or hour and a half to a maximum of three injections, but one is generally sufficient. The temperature reaction becomes manifest in one or two hours. He does not give specific instances or figures, but relates that after his course of treatment with potassium iodid supplemented by subcutaneous injection of a 1 per cent. solution of sodium arsenate, some of the patients are still living who had been told years before by leading clinicians that they had internal and hence inaccessible cancer. All his patients thus treated were in this inoperable class, as he always operates for accessible cancer.

85. Fish Poisoning.—Konstansoff found the bacillus of fish poisoning in two kinds of fish. Very small doses of pure agar cultures killed white mice in from six to twelve hours. As this bacillus is very similar to the *Bacillus botulinus* of van Ermengem, Konstansoff thinks that it is probably a variety of the latter.

86. Laryngectomy for Cancer.—Mintz has removed the entire larynx on account of malignant disease in 29 cases, and tabulates here the details of each. Seven of his patients (24 per cent.) lived for more than a year, and 3 are in good health to date over seven, eight and twelve years since the operation. It is remarkable that the two patients who have survived the longest both required a second operation for recurrence in a gland four and twenty months after the primary laryngectomy. The ultimate outcome in a number of the other cases is not known later than a few months.

90. Muscle Sign of Chronic Appendicitis.—Volkovitch found that in chronic appendicitis, or in intervals between acute attacks, the abdomen is relaxed in the right iliac region contrary to what is usually observed in acute appendicitis. In addition the abdominal muscles on the right side seem to shrink and atrophy. The more pronounced this so-called muscle sign, the severer is the appendicular lesion. This sign is absent with inguinal hernia, but Volkovitch is unable so far to tell if it is positive in other lesions of the right abdominal cavity, such as pelvic lesions in females, gall-stones, etc. The relaxed condition of the abdominal muscles in chronic appendicitis may lead to scoliosis on the left side, and he asserts that left-sided scoliosis should raise suspicions of a possible chronic appendicitis.

St. Petersburg medizinische Zeitschrift

July 15, XXXIX, No. 14, pp. 169-184

- 94 Dangers of Transmission of Disease by Head Louse. (Pediculosis capitis.) A. Spindler.

Hospitalstidende, Copenhagen

July 28, LVII, No. 30, pp. 921-952

- 95 *Cysts in the Pancreas. J. Ipsen. Commenced in No. 29.
96 *Lye Injury of Esophagus. (Tilfælde af alvorlig øsophagusætsning.) P. Zachariae.
August 12, No. 32, pp. 985-1016
97 *Rupture of the Mesentery. K. Sand.
August 19, No. 33, pp. 1017-1048
98 Unilateral Multiple Chondromatosis in Girl of 6. (Ollier's vaxtforstyrrelse.) A. Bojesen. Concluded in No. 34.
99 Conflicting Tendencies in the Psychiatry of the Day. (Stridende strømninger i tidens sindssygelære.) Dedichen. Commenced in No. 32.

acute inflammation follows if the trauma is very much pancreatic juice was forced out, while the mere production of a cyst if the injury was slight. In another of his cases the cyst was secondary to the cancer found with it, the cancer having the tissues like a trauma. The four other patients had recurring attacks of pain, and gall-stones were necropsy in two cases. These were probably the causes of attacks of pain, and the passage of a stone may have stretched the opening leading up into the pancreas resulting destruction of pancreas tissue and cyst.

In the other cases the attacks of pain and of transient jaundice retrospectively suggest gall-stones. Search was made for them at the operation on the 11th. The pains, however, were always localized on the right side. The smaller the cyst the more difficult the diagnosis. The case the symptoms seemed to suggest perforation of ulcer or peritonitis but the signs of pleuritis and albuminuria did not agree with this, and Roemer's examination revealed an accumulation of fluid just below the left diaphragm. Treatment can be only surgical, so the lips of the cyst to the skin with care not to let the contents of the cyst come in contact with the skin. There is a defined lining of the cyst in the class of cases here in which digestion of tissue is responsible for the destruction. Any attempt to cut out the cyst merely entails more destruction and may entail hemorrhage except if the cyst is found circumscribed and lined with epithelium. It is merely a small corrosion cyst in the head of the pancreas.

96. Corrosion of Esophagus from Lye.—The child drank a swallow of lye and the stomach was rinsed out once. A few days later the lining of the esophagus was thrown up in the form of a nearly perfect tube 14 cm. long. The esophagus was systematically dilated with a catheter passed down into the stomach once a day for about three months and then at longer intervals, and the child has had no further signs of trouble. The catheter was introduced for the first time twelve days after the lye was swallowed, seven days after the lining of the esophagus had been cast off. The text-books warn not to begin catheterization until after there is no more blood or pus in the mucus, that is, not for three to six weeks, but Zachariae's plan of warding off stenosis in this case suggests that it is better to commence earlier. Rovsing found it impossible in this case to introduce even the finest sound one month after the caustic had been swallowed. It is also a question whether the dilatation must be kept up. Bloch advises it occasionally all through life, to ward off recurrence, and Zachariae another patient who had return of trouble after 60 years after the lye injury occurred during childhood. It is certainly a wise plan, he remarks, to let no month pass without introducing the catheter once, as prevention in these cases is easy while it is so hard to cure inveterate stenosis.

97. Rupture of the Mesentery.—Sand says that there have been only five cases of this during the last ten years at the Copenhagen public hospital; Prutz has recently collected forty-four cases. The mortality in the operative cases is 38 per cent. while all died in the cases in which no operation was attempted. The exact diagnosis is never possible until the abdomen is opened and then it is always a question whether the bowel should be resected or not. In doubt, it is safer to do the resection. He describes in a typical serious case successfully treated on these principles.

